Vol. 1017 Number 1

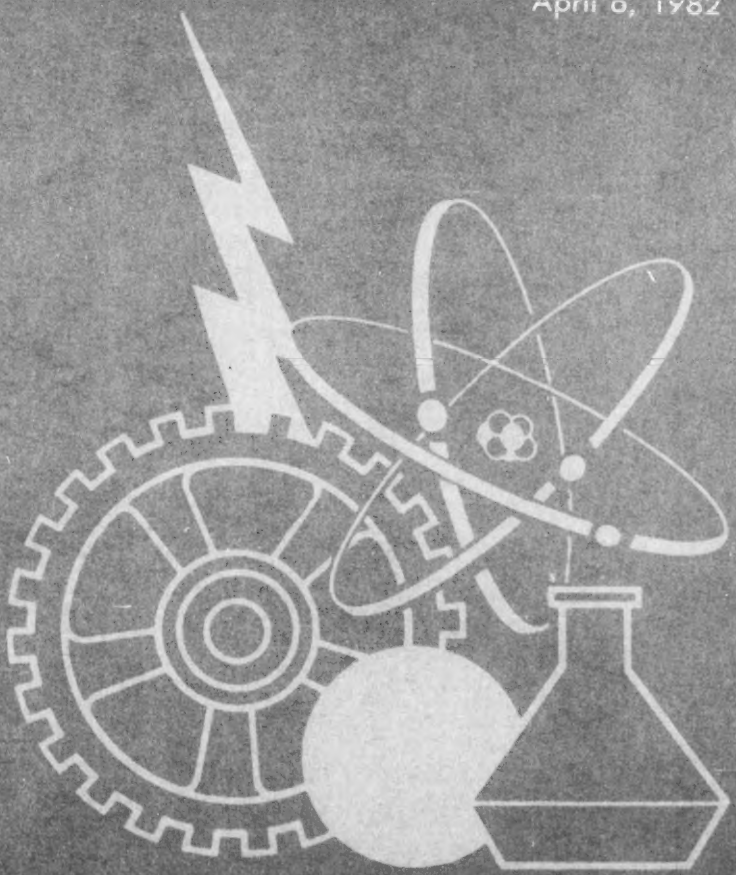
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 6, 1982



U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

April 6, 1982 Volume 1017 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1017 OG 2
Reissue Applications Filed	1017 OG 2
Requests for Reexamination Filed	1017 OG 3
Availability of Copies of the Magnetic Tapes of the Third Edition of the International Patent Classification (IPC)	1017 OG 3
Adverse Decisions in Interference	1017 OG 4
Change in Drafting Practice	1017 OG 4
Patent Certificates of Correction	1017 OG 6
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1017 OG 7
Condition of Patent Applications	1017 OG 8
Defensive Patent Publication (101,701)	1
Reissue Patents Granted (30,893)	3
Plant Patents Granted (4,835)	5
Patents Granted	
General and Mechanical (4,322,858)	7
Chemical (4,323,358)	179
Electrical (4,323,717)	279
Design Patents Granted (263,640)	381
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 42
Index of Applicants of Defensive Publications	PI 45
Classification of	
Patents (Including Reissues)	PI 47
Designs, Plants and Defensive Publications	PI 50
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 51
Designs, Plants and Applicants of Defensive Publications	PI 52
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly, subscription $360.00 per annum for first-class mailing, also available as fourth-class mail at $250.00 domestic; $312.50 foreign; foreign first-class mailing rates will be furnished upon request; single copies each, $6.50 domestic, $8.15 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $115.00 per annum, foreign mailing $143.75 per annum; single copies $3.75 each domestic, $4.10 foreign.

GENERAL INFORMATION concerning PATENTS, price $2.50 each.

GENERAL INFORMATION concerning TRADEMARKS, price $2.00 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,449,938, Re. S.N. 339,173, Filed Jan. 13, 1982, Cl. 73/23, METHOD FOR SEPARATING AND DETECTING FLUID MATERIALS, John Calvin Giddings, Owner of Record: *University of Utah, Salt Lake City, Utah,* Attorney or Agent: Vaughn W. North, Ex. Gp.: 244

3,520,186, Re. S.N. 342,432, Filed Jan. 25, 1982, Cl. 73/290, ULTRASONIC FLUID INTERFACE SENSING, George L. Adams, et al., Owner of Record: *National Sonics Corp., Farmingdale, N.Y.,* Attorney or Agent: Harold I. Kaplan, et al., Ex. Gp.: 244

3,813,699, Re. S.N. 324,992, Filed Nov. 25, 1981, Cl. 3/1, PROSTHETIC HIP JOINT, Richard P. Giliberty, Owner of Record: *Gill Prosthesis, Inc., Manhasset, N.Y.,* Attorney or Agent: Richard Brink, et al., Ex. Gp.: 337

3,886,979, Re. S.N. 294,230, Filed Aug. 19, 1981, Cl. 138/118.1, SHIRRED TUBULAR FOOD CASINGS HAVING A BARRIER COATING, Jerome J. M. Rasmussen, Owner of Record: *Union Carbide Corp., New York, N.Y.,* Attorney or Agent: James C. Arvantes, et al., Ex. Gp.: 243

3,981,945, Re. S.N. 344,173, Filed Jan. 29, 1982, Cl. 260/950, COATING COMPOSITIONS COMPRISING A POLYSULFONE AND A FLUOROCARBON POLYMER, Terence E. Attwood, et al., Owner of Record: *Imperial Chemical Industries Ltd., London, England,* Attorney or Agent: Watson T. Scott, et al., Ex. Gp.: 142

4,000,493, Re. S.N. 323,206, Filed Nov. 20, 1981, Cl. 346/1, ACOUSTOOPTIC SCANNER APPARATUS AND METHOD, Richard A. Spaulding, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Milton S. Sales, et al., Ex. Gp.: 211

4,118,369, Re. S.N. 325,392, Filed Nov. 27, 1981, Cl. 260/45.8, 2,2,6,6-TETRASUBSTITUTED-4-PIPERIDYL CARBOXY HETEROCYCLIC COMPOUNDS AS STABILIZERS FOR SYNTHETIC POLYMERS, Montonobu Minagawa, et al., Owner of Record: *Argus Chemical Corp., Brooklyn, N.Y.,* Attorney or Agent: John R. Janes, Ex. Gp.: 143

4,129,097, Re. S.N. 340,415, Filed Jan. 18, 1982, Cl. 119/28, FLOOR COVERING SHEET FOR STABLES, Udo Schwartzkopff, et al., Owner of Record: *Akzona, Inc., Ashville, N.C.,* Attorney or Agent: Jack H. Hall, Ex. Gp.: 333

4,170,958, Re. S.N. 311,313, Filed Oct. 14, 1981, Cl. 118/325, DEVICE FOR APPLYING DESIGNS, Manfred Moser, Owner of Record: *Eduard Kusters, Krefeld, Germany,* Attorney or Agent: Richard L. Mayer, Ex. Gp.: 162

4,177,489, Re. S.N. 327,644, Filed Dec. 4, 1981, Cl. 360/74.2, TAPE RUNNING MECHANISM PROVIDED WITH AUTOMATIC STOPPING DEVICE, Isao Hasegawa, Owner of Record: *Clarion Co., Ltd., Saitama, Japan,* Attorney or Agent: William A. Drucker, Ex. Gp.: 235

4,177,564, Re. S.N. 327,289, Filed Dec. 3, 1981, Cl. 433/82, DENTAL HANDPIECE CONNECTOR, Lloyd P. Flatland, Owner of Record: *Inventor,* Attorney or Agent: J. Georg Seka, Ex. Gp.: 333

4,179,786, Re. S.N. 332,802, Filed Dec. 21, 1981, Cl. 29/407, TENSION CONTROL OF FASTENERS, Siavash Eshghy, Owner of Record: *Rockwell International Corp., Pittsburgh, Pa.,* Attorney or Agent: Richard A. Speer, Ex. Gp.: 321

4,181,821, Re. S.N. 336,067, Filed Dec. 31, 1981, Cl. 179/1SD, MULTIPLE TEMPLATE SPEECH RECOGNITION SYSTEM, Frank C. Pirz, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 236

4,183,202, Re. S.N. 339,786, Filed Jan. 15, 1982, Cl. 057/328, METHOD AND APPARATUS FOR PRODUCING SPUN YARN, Toshihumi Morihashi, Owner of Record: *Murata Kikai Kabushiki Kaisha, Minamihi, Japan,* Attorney or Agent: Robert W. Spensley, et al., Ex. Gp.: 244

4,184,205, Re. S.N. 342,159, Filed Jan. 25, 1982, Cl. 364/508, DATA ACQUISITION SYSTEM, Robert S. Morrow, Owner of Record: *IRD Mechanalysis, Inc., Columbus, Ohio,* Attorney or Agent: Gerald L. Smith, et al., Ex. Gp.: 236

4,184,838, Re. S.N. 339,679, Filed Jan. 15, 1982, Cl. 431/202, IGNITER FOR OIL AND/OR GAS WELL DRILLING OPERATION, Kenneth L. Burns, et al., Owner of Record: *Loffland Brothers Co., Tulsa, Okla.,* Attorney or Agent: James R. Head, et al., Ex. Gp.: 345

4,185,437, Re. S.N. 342,478, Filed Jan. 25, 1982, Cl. 52/601, BUILDING WALL PANEL AND METHOD OF MAKING SAME, Ralph C. Robinson, Owner of Record: *Olympian Stone Co., Redmond, Wash.,* Attorney or Agent: James R. Uhlir, et al., Ex. Gp.: 354

4,191,334, Re. S.N. 342,337, Filed Jan. 25, 1982, Cl. 24/16PB, CABLE TIE, John J. Bulanda, et al., Owner of Record: *Panduit Corp., Tinley Park, Ill.,* Attorney or Agent: Charles R. Wentzel, Ex. Gp.: 355

4,193,247, Re. S.N. 342,191, Filed Jan. 25, 1982, Cl. 52/713, PANEL MOUNTING CLIP, Robert E. Heckelsberg, Owner of Record: *AMCA International Corp., Hanover, N.H.,* Attorney or Agent: Cyrus G. Minkler, et al., Ex. Gp.: 354

4,194,661, Re. S.N. 342,621, Filed Jan. 25, 1982, Cl. 226/95, TAPE ADVANCING METHODS AND APPARATUS, Frederic F. Grant, Owner of Record: *Bell*

& Howell Co., Chicago, Ill., Attorney or Agent: Luc P. Benoit, Ex. Gp.: 242

4,194,935, Re. S.N. 336,294, Filed Dec. 31, 1981, Cl. 148/175, METHOD OF MAKING HIGH MOBILITY MULTILAYERED HETEROJUNCTION DEVICES EMPLOYING MODULATED DOPING, Raymond Dingle, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 111

4,199,235, Re. S.N. 328,660, Filed Dec. 3, 1981, Cl. 354/25, CAMERA WITH AUTOFOUSINE DEVICE, Mutshide Matsuda, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Joseph Fitzpatrick, et al., Ex. Gp.: 211

4,203,114, Re. S.N. 341,914, Filed Jan. 22, 1982, Cl. 343/100.5A, DIGITAL BEARING INDICATOR, Carl Gerst, et al., Owner of Record: *Anaren Microwave, Inc., Syracuse, N.Y.,* Attorney or Agent: Camil P. Spiecens, et al., Ex. Gp.: 222

4,212,613, Re. S.N. 343,057, Filed Jan. 27, 1982, Cl. 425/141, APPARATUS FOR HANDLING HEAT-SOFTENABLE BATCH MATERIAL, Stephen Seng, Owner of Record: *Owens-Corning Fiberglas Corp., Toledo, Ohio,* Attorney or Agent: Ronald C. Hudgens, et al., Ex. Gp.: 147

4,213,282, Re. S.N. 342,151, Filed Jan. 25, 1982, Cl. 52/404, METAL PANEL ROOFING STRUCTURE, Robert E. Heckelsberg, Owner of Record: *AMCA International Corp., Hanover, N.H.,* Attorney or Agent: Cyrus G. Minkler, et al., Ex. Gp.: 354

4,224,775, Re. S.N. 342,701, Filed Jan. 25, 1982, Cl. 52/528, BUILDING PANEL, Robert E. Heckelsberg, Owner of Record: *AMCA International Corp., Hanover, N.H.,* Attorney or Agent: Cyrus G. Minkler, et al., Ex. Gp.: 354

4,225,672, Re. S.N. 343,922, Filed Jan. 29, 1982, Cl. 435/74, METHOD FOR PRODUCING MALTO-OLIGOSACCHARIDE GLYCOSIDES, Leo M. Hall, Owner of Record: *Inventor,* Attorney or Agent: John H. Faro, et al., Ex. Gp.: 172

4,228,365, Re. S.N. 324,709, Filed Nov. 24, 1981, Cl. 307/221.D, MONOLITHIC INFRARED FOCAL PLANE CHARGE COUPLED DEVICE IMAGER, William A. Gutierrez, et al., Owner of Record: *The United States of America as represented by the Secretary of the Army, Washington, D.C.,* Attorney or Agent: Nathan Edelberg, et al., Ex. Gp.: 254

4,229,786, Re. S.N. 312,525, Filed Oct. 19, 1981, Cl. 363/126, FLY-BACK TRANSFORMER WITH A LOW RINGING RATIO, Yutaka Mitani, Owner of Record: *Murata Manufacturing Co., Kyoto, Japan,* Attorney or Agent: Sidney, G. Faber, et al., Ex. Gp.: 212

4,250,282, Re. S.N. 338,504, Filed Jan. 11, 1982, Cl. 528/509, MELAMINE RESIN, PROCESS FOR ITS MANUFACTURE AND ITS USE FOR THE MANUFACTURE OF COATED WOOD-BASED MATERIALS AND LAMINATES, Peter Dorries, et al., Owner of Record: *Cassella Aktiengesellschaft, Frankfurt am Main, Germany,* Attorney or Agent: Arthur G. Connolly, Ex. Gp.: 144

4,252,512, Re. S.N. 307,336, Filed Sept. 30, 1981, Cl. 424/164, SYNERGISTIC FUNGICIDAL COMPOSITIONS CONTAINING 1,2,4-TRIAZOLE DERIVATIVES, Wilheim Brandes, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 125

4,259,920, Re. S.N. 324,028, Filed Nov. 23, 1981, Cl. 118/116, TONER IMAGE PRESSURE FIXING DEVICE, Yoshitaka Sasaki, Owner of Record: *Hitachi Metals, Ltd., Tokyo, Japan,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 162

4,260,912, Re. S.N. 336,009, Filed Dec. 30, 1981, Cl. 307/597, DIGITAL DELAY GENERATOR, Melvin D. Bjorke, Owner of Record: *Honeywell, Inc., Minneapolis, Minn.,* Attorney or Agent: John P. Sumner, et al., Ex. Gp.: 254

4,262,677, Re. S.N. 302,581, Filed Sept. 15, 1981, Cl. 128/759, CULTURE SAMPLING DEVICE AND METHOD, Robert F. Bader, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 335

4,275,343, Re. S.N. 337,139, Filed Jan. 5, 1982, Cl. 318/721, BACK EMF CONTROLLED PERMANENT MAGNET MOTOR, Donald E. Fulton, et al., Owner of Record: *The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.,* Attorney or Agent: Joseph Weingarten, et al., Ex. Gp.: 217

4,283,731, Re. S.N. 339,255, Filed Jan. 13, 1982, Cl. 346/75, INK JET PRINTING APPARATUS, Dennis E. Bok, et al., Owner of Record: *The Mead Corp., Dayton, Ohio,* Attorney or Agent: Nathaniel R. French, Ex. Gp.: 211

4,293,004, Re. S.N. 339,367, Filed Jan. 15, 1982, Cl. 137/884, ELECTRONIC VALVE ASSEMBLY FOR GLASSWARE FORMING MACHINERY, Earl L. Lowe, Owner of Record: *Ball Corp., Muncie, Ind.,* Attorney or Agent: Gilbert E. Alberding, Ex. Gp.: 341

4,293,268, Re. S.N. 342,245, Filed Jan. 25, 1982, Cl. 414/591, MATERIAL HANDLING DEVICE, George Mink, Owner of Record: *Inventor,* Attorney or Agent: Ernest A. Beutler, et al., Ex. Gp.: 314

4,296,581, Re. S.N. 342,162, Filed Jan. 25, 1982, Cl. 52/520, ROOFING STRUCTURE, Robert E. Heckelsberg, Owner of Record: *AMCA International Corp., Hanover, N.H.,* Attorney or Agent: John A. Artz, et al., Ex. Gp.: 354

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,707,126, Reexam. No. 90/000,167, Requested: Feb. 24, 1982, Cl. 105/282, HOPPER GATE LATCHING MECHANISM, Francis M. Nester, Owner of Record: *Keystone Ind., Inc., Chicago, Ill.,* Attorney or Agent: Albert W. Bicknell, Ex. Gp.: 310, Requester: ACF Ind., Inc., Saint Charles, Mo.

4,059,405, Reexam. No. 90/000,171, Requested: Mar. 1, 1982, Cl. 23/230, METHOD AND APPARATUS FOR ANALYSIS OF CONSTITUENT CARRIED IN FIBROUS MEDIUM, Lester A. Sodickson, et al., Owner of Record: *Damon Corp., Needham Heights, Mass.,* Attorney or Agent: Herbert P. Kenway, Ex. Gp.: 170, Requester: American Hospital Supply Corp., Miami, Fla.

Availability of Copies of the Magnetic Tapes of the Third Edition of the International Patent Classification (IPC)

The Assembly of the IPC Union has decided to make available copies of the magnetic tapes of the third edition of the IPC through the International Bureau of the World Intellectual Property Organization.

The IPC Assembly made the following decisions:

"The International Bureau should put at the disposal of the Industrial Property Offices of any country member of the IPC Union which so wishes the magnetic tape of the third edition of the IPC *at cost,* provided that any such Office receiving a tape accepts the three conditions set forth . . . below:

(i) the tape is used by those Offices . . . for the purposes of carrying out their functions,
(ii) no reproduction of the tape or its contents, in whole or in part, is made in the form of paper copies or microfiches, except in the case of on-line printouts, and
(iii) the tapes or copies thereof, in whole or in part, are not made available to any third party."

The Committee of Experts of the IPC Union decided that the tape (in the English *or* French language) would be made available to Industrial Property Offices of countries being members of the IPC Union at the price of 1,000 Swiss francs.

In order to carry out its function of disseminating patent information contained on IPC tapes, the U.S. Patent and Trademark Office may need the assistance of qualified U.S. public organizations or private companies. Accordingly, the Office will consider requests from such organizations or companies interested in disseminating such information.

The Committee also decided that, subject to the conditions enumerated in (ii) and (iii) above, the tapes would be made available for the following prices to any public organization or private company authorized by its governement:

- for internal use only, at the price of 5,000 Swiss francs; and
- for exploitation of the tape on a commercial basis, at the price of 30,000 Swiss francs.

The Patent and Trademark Office will authorize United States public organizations and private companies to purchase the tape under these conditions and at the agreed upon prices quoted.

For further information contact:

Office of International Patent Classification
Crystal Square, Bldg. 4, Room 108
U.S. Patent and Trademark Office
Washington, D.C. 20231
Tel: (703) 557-3756

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Mar. 8, 1982.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,812,245, M.A. Dugan, NOVEL COMPOSITIONS FOR RADIOTRACER LOCALIZATION OF DEEP VEIN THROMBI, Interference No. 99,133, decided Oct. 29, 1981, claims 1, 5 & 10.

Patent No. 3,941,898, S. Sadamatsu and T. Nozaki, DEVELOPING METHOD UTILIZING PULVERIZED, COLORED, CROSSLINKED, VINYLIC POLYMER RESIN AS TONER, Interference No. 99,884, decided Dec. 17, 1981, claims 1-3, 5, 7, 8, 11 & 13.

Patent No. 4,051,032, J.A. Borchardt, WATER TREATMENT SYSTEM, Interference No. 100,414, decided Jan. 6, 1982, claims 8 & 16.

Patent No. 4,069,743, B. Bertanza, CONTROL UNITS FOR VEHICLE POWERSTEERING MECHANISMS, Interference No. 100,177, decided Aug. 13, 1981, claim 1.

Patent No. 4,104,029, C.L. Maier, Jr., PROCEDURE FOR THE ASSAY OF PHARMACOLOGICALLY IMMUNOLOGICALLY AND BIOCHEMICALLY ACTIVE COMPOUNDS IN BIOLOGICAL FLUIDS, Interference No. 100,521, decided Nov. 1, 1981, claims 1 -12 & 14.

Patent No. 4,108,653, M.T.J. Peters, PRESSURE-FIXABLE TONER POWDER WITH A THERMOPLASTIC POLYETHYLENE BINDER, Interference No. 100,558, decided Dec. 1, 1981, claims 1-11.

Patent No. 4,138,554, T. Naito, J. Okumura and M. Oka, 7-[D-α-(4-HYDROXY-1,5-NAPHTHYRIDI NE-3-CARBOXAMIDO)-α-PHENYL(AND P-HYDROXY-PHENYL) ACETAMIDO]-3-CARBAMOYLOXY-METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS, Interference No. 100,579, decided Dec. 2, 1981, claims 1-5, 16-20 and 31-35.

Patent No. 4,145,284, E.L. Neu, METHOD FOR MAKING POLYMERIC FILTER AIDS AND PRODUCTS THEREOF, Interference No. 100,555, decided Jan. 19, 1982, claims 1 & 3.

NANNIE B. HENRY
Deputy Clerk
Board of Patent Interferences.

Change in Drafting Practice

Effective Apr. 12, 1982, the Patent and Trademark Office is terminating its drawing correction service.

In order to effect any changes in the drawings, applicants will be responsible for submitting either new drawings or having the drawings corrected by a bonded commercial draftsman, at applicant's expense, in the manner specified below. The new practice will permit applicants to delay correction of drawings in almost all cases until after the Notice of Allowance is mailed.

The initial list of bonded commercial draftsmen appears below. This list will be expanded as more commercial draftsmen are bonded. Applicants will, at least initially, be supplied with a current list of the bonded draftsmen with all Office actions requiring a drawing change.

The following is a letter which will be supplied, at least initially, to applicants in all Office actions requiring a drawing change. This letter explains the procedures for accomplishing the above, sets forth the time period within which the drawings must be corrected, and lists all of the currently bonded commercial draftsmen.

U.S.Department of Commerce, Patent and Trademark Office	Attachment to Paper Number
	Serial No.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities (Draftsman's objections on PTO-948)

In order to correct any informalities in the drawings, applicants *MUST* comply with options (a) or (b) below. Failure to do so will result in *ABANDONMENT* of the application.

a) File new drawings with the changes incorporated therein. Applicant may delay filing the new drawings until the application is allowed by the examiner. If delayed, the new drawings *MUST* be filed within the *THREE MONTH* statutory period set for payment of the base issue fee in the **"NOTICE OF ALLOWANCE AND BASE ISSUE FEE DUE"** (PTOL-85). Also, if delayed, the drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsman and which indicates the following in the upper right hand corner:

Date of the Notice of Allowance
Issue Batch Number
Serial Number

b) Request a commercial bonded drafting firm (see list below) to make the necessary corrections.

A BONDED DRAFTSMAN MUST BE *AUTHORIZED, THE CORRECTIONS EXECUTED AND THE CORRECTED DRAWINGS RETURNED TO THE OFFICE* DURING THE THREE MONTH STATUTORY PERIOD SET FOR PAYMENT OF THE BASE ISSUE FEE IN THE "NOTICE OF ALLOWANCE AND BASE ISSUE FEE DUE" (PTOL-

85). NOTE THAT THE STATUTE DOES NOT PERMIT EXTENSION OF THE THREE MONTH PERIOD SET TO PAY THE BASE ISSUE FEE.

2. Corrections other than Informalities Noted by the Draftsman on the PTO–948

All changes to the drawings, other than informalities noted by the Draftsman, *MUST* be made in the same manner as above except that, if delayed option (a) is selected, normally, a sketch of the changes to be incoroprated into the new drawings *MUST* be approved by the examiner before the application will be allowed. If option (b) is selected, normally, applicants must submit, in duplicate, a separate paper containing a sketch of the proposed changes before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

3. Listing of Bonded Draftsmen

Graphe-Tech
11301 Rockville Pike
Kensington, Md. 20895
(301) 881-9400

Ultra Graphics, Inc.
Suite 300
3720 Farragut Ave.
Kensington, Md. 20795
(301) 946-1343

Mantech International Corp.
2121 Eisenhower Ave.
4th Fl.
Alexandria, Va. 22314
(703) 838-5793

National Graphic Center
205 W. Jefferson St.
Falls Church, Va. 22046
(703) 533-8700

Mil-R Productions
2107 Mt. Vernon Ave.
Alexandria, Va. 22301
(703) 548-3879

Ord-Marine Engineering
10315 Kensington Pky.
Kensington, Md. 20895
(301) 949-3282

Patent Reproduction Co.
26 "N" St., S.E.
Washington, D.C. 20003
(202) 488-7096

Quinn Pat. Drwg. Service Co.
2021 Crystal Plaza Dr.
Arlington, Va. 22202
(703) 521-1650

Kirby Lithographic Co.
2900 South Eads St.
Arlington, Va. 22202
(703) 684-7600

Technical Illustrator
1911 Jeff. Davis Hwy.
Suite 600-CM1
P.O. Box 2627
Arlington, Va. 22202
(703) 920-8900

IT IS SUGGESTED THAT APPLICANTS DETACH THIS LETTER FROM THE OFFICE ACTION AND ATTACH IT TO THE FRONT OF APPLICANT'S FILE AS A REMINDER THAT, IN ORDER TO AVOID ABANDONMENT, A BONDED DRAFTSMAN MUST BE *AUTHORIZED, THE CORRECTIONS EXECUTED AND THE CORRECTED DRAWINGS RETURNED TO THE OFFICE,* OR NEW DRAWINGS SUBMITTED, DURING THE THREE MONTH STATUTORY PERIOD SET FOR PAYMENT OF THE BASE ISSUE FEE. NOTE THAT THE STATUTE DOES NOT PERMIT EXTENSION OF THE THREE MONTH PERIOD SET TO PAY THE BASE ISSUE FEE.

Currently there is a large backlog of applications pending before the Office draftsmen. Applicants whose applications are part of this backlog are strongly encouraged to have the necessary drawing corrections made by one of the bonded commercial draftsmen to expedite the issuance of their applications. If there has been authorization to charge a deposit account for these corrections, the authorization will not be processed. If a fee has been paid with cash, a refund will be processed.

The requirement of 37 CFR §§1.85, 1.86(b) and 1.123(a), specifying that drawings, or corrections to the drawings, may or must be made by the Office, is hereby waived.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Mar. 16, 1982.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 6, 1982

Re. 30,495	4,282,711	4,299,988	4,307,205
4,097,069	4,284,624	4,300,343	4,307,289
4,124,296	4,285,772	4,300,353	4,307,737
4,156,014	4,286,087	4,301,363	4,307,757
4,187,631	4,286,148	4,301,779	4,307,772
4,192,772	4,286,677	4,301,946	4,308,146
4,224,379	4,288,394	4,302,206	4,308,275
4,228,938	4,288,399	4,302,342	4,308,662
4,233,187	4,288,434	4,302,344	4,308,795
4,233,728	4,288,555	4,303,011	4,309,451
4,236,964	4,288,781	4,303,295	4,309,479
4,237,409	4,289,466	4,303,631	4,309,567
4,238,570	4,290,103	4,303,677	4,309,756
4,242,249	4,291,374	4,303,704	4,309,770
4,244,878	4,292,374	4,303,717	4,309,871
4,246,318	4,292,685	4,304,010	4,309,908
4,251,384	4,293,721	4,304,508	4,310,141
4,255,895	4,294,158	4,304,536	4,310,183
4,255,919	4,294,646	4,304,596	4,310,459
4,256,047	4,296,527	4,305,044	4,310,474
4,256,518	4,296,993	4,305,555	4,310,479
4,257,829	4,297,185	4,306,289	4,310,483
4,261,525	4,297,247	4,306,341	4,310,641
4,261,667	4,297,468	4,306,366	4,310,690
4,264,480	4,297,680	4,306,377	4,310,774
4,265,640	4,297,735	4,306,523	4,310,949
4,270,937	4,298,416	4,306,629	4,311,092
4,275,035	4,298,669	4,306,837	4,311,352
4,275,050	4,298,731	4,306,842	4,311,513
4,275,148	4,298,797	4,306,919	4,311,562
4,275,748	4,299,011	4,307,104	4,311,750
4,277,676	4,299,438	4,307,123	4,312,148
4,278,663	4,299,454	4,307,124	
4,279,294	4,299,476	4,307,131	
4,281,388	4,299,986	4,307,156	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 6, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-80
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-04-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-02-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-08-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	6-18-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-09-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-17-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	2-26-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	5-05-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-30-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-14-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	5-06-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	12-11-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	6-02-80

Expiration of patents: The patents within the range of numbers indicated below expire during March 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,171,131 to 3,176,313, inclusive

Plant Patents ..... Numbers 2,486 to 2,489 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED APRIL 6, 1982

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T101,701
PORTABLE PROGRAMMABLE CALCULATOR

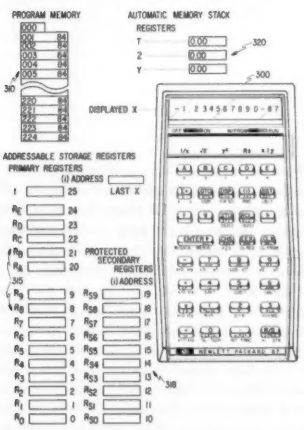
William E. Egbert, 1760 Noranda Dr., #1, Sunnyvale, Calif. 94087

Continuation of Ser. No. 46,971, Jun. 8, 1979, abandoned, which is a continuation of Ser. No. 933,204, Aug. 14, 1978, abandoned, which is a continuation of Ser. No. 817,934, Jul. 22, 1977, abandoned, which is a continuation of Ser. No. 701,718, Jul. 1, 1976, abandoned. This application Aug. 28, 1980, Ser. No. 182,161

Int. Cl.[3] G06F *15/02, 15/04*

U.S. Cl. 364—706

19 Sheets Drawing. 157 Pages Specification



Two battery-powered hand-held programmable calculators for performing arithmetic, trigonometric and logarithmic functions and displaying the results thereof are provided with the capability of being fully programmable via magnetic cards or a keyboard. Through a unique transmographic coding scheme, programs coded on one embodiment may be executed on a second embodiment even though the key codes for the respective functions are dissimilar. In one embodiment, a processor distinguishes between magnetic cards containing coded instructions and cards containing data. The calculator prompts the user via the display when additional cards are needed to form a complete set of program instructions. The processor, registers, and display may be initialized by control words on magnetic cards. During program execution, the calculator can pause to permit data entry from the keyboard or from magnetic cards. The operator may also cause the calculator to pause and display the data of an intermediate calculation. A number of stack and program review capabilities are provided, including the ability to accelerate, temporarily suspend, or indefinitely suspend review. The operator may select either of two sets of registers for access by the processor. In one embodiment, a hard copy printer is provided for creating a permanent record of the calculations.

T101,702
TEXTILE SIZING COMPOSITIONS

Kenneth R. Barton, 201 Claymore Dr., Kingsport, Tenn. 37663, and Richard L. McConnell, 421 Manderley Rd., Kingsport, Tenn. 37660

Continuation of Ser. No. 136,148, Mar. 31, 1980, abandoned. This application Apr. 27, 1981, Ser. No. 258,155

Int. Cl.[3] C08F *110/02;* **D06M** *15/26*

U.S. Cl. 526—352

No Drawing. 13 Pages Specification

Disclosed are hot-melt polyethylene compositions which are particularly useful as sizing compositions for textile materials. The compositions have a melt viscosity of from about 150 cp at 125° C. to about 6000 cp at 190° C. and may be removed from textile substrates using conventional petroleum based solvents. Useful polyethylenes include those having viscosities of from about 100 cp at 125° C. to about 40,000 cp at 190° C., densities of from about 0.90 to about 0.97 and melting points of from about 95° C. to about 135° C.

REISSUES

APRIL 6, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,893

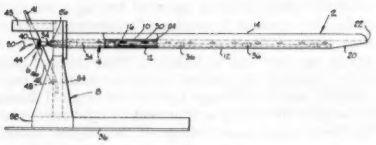
METHOD OF VACUUM PACKAGING COMPRESSIBLE MATERIALS AND APPARATUS

John E. Puchosic, McPherson, Kans., assignor to Johns-Manville Corporation, New York, N.Y.

Original No. 4,016,707, dated Apr. 12, 1977, Ser. No. 663,373, Mar. 3, 1976. Application for reissue Dec. 26, 1978, Ser. No. 973,422

Int. Cl.[3] B65B *1/26*

U.S. Cl. 53—436 12 Claims



1. In *a* method of packaging a compressible material having a generally cylindrical configuration wherein said compressible material is placed inside a tubular container made from a flexible fluid impervious material, [a partial vacuum is created inside said container by withdrawing air from the container to compress the compressible material inside the container, and] *closing any open ends of said container after said compressible material has been placed therein, creating a seal around a portion of the exterior of said flexible container, making one or more perforations in the flexible fluid impervious material within said sealed area using a puncturing means and creating a partial vacuum in said container by continuously withdrawing air from inside said container through said perforations until said compressible material has been compressed to a diameter less than the size of* a restraining sleeve [is] *to be* applied around said compressed container to maintain the compressible material in a compressed state when said partial vacuum is lost, the improvement comprising:

[closing any open ends of said container after said compressible material has been placed therein, creating a seal around a portion of the exterior of said flexible container, making one or more perforations in the flexible fluid impervious material within said sealed area and withdrawing air from inside the container through said perforations until said compressible material has been compressed to a diameter less than the size of said retaining sleeve,] *discontinuing the withdrawal of air from said container through said perforations, forcing said flexible, fluid impervious material away from said puncturing means and allowing said flexible fluid impervious-material to be pressed against said compressible material in order to substantially self-seal said perforations* and there after applying said restraining sleeve.

Re. 30,894

OSCILLATING PISTON APPARATUS

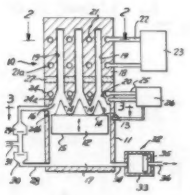
Mark Schuman, 101 G St., SW., Apt. #516, Washington, D.C. 20024

Original No. 3,899,888, dated Aug. 19, 1975, Ser. No. 465,138, Apr. 29, 1974. Continuation of Ser. No. 227,514, Feb. 18, 1972, Pat. No. 3,807,904, which is a continuation-in-part of Ser. No. 121,371, Mar. 5, 1971, abandoned. Application for reissue Aug. 12, 1976, Ser. No. 713,841

The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.[3] F02G *1/04*

U.S. Cl. 60—520 162 Claims



1. An oscillating piston apparatus comprising a cylinder, a free piston in the cylinder, said [cyliner] *cylinder* having a side wall with a port therein, a rebound chamber containing compressible fluid for reversing the motion of the piston[.], said rebound chamber having as a moving wall portion a face of the piston, means including said rebound chamber for sustaining oscillatory motion of the piston in the cylinder and means for controlling the location of the center of oscillation of the piston in the cylinder, said controlling means including said rebound chamber and a passageway communicating with the cylinder via the port, said passageway by-passing a portion, and only a portion, of the axial length of the cylinder, said passageway having a fluid flow impedance which is substantially the same for fluid flow in either direction through the passageway, wherein said port, said by-passed portion of the cylinder, and an unbypassed portion of the cylinder are all at least partially traversed by the piston.

Re. 30,895

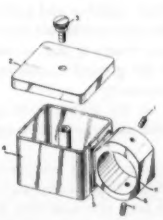
FILTER PAPER DISPENSER

Anthony W. Butera, 112 Tuthill St., Port Jefferson, N.Y. 11777

Original No. 4,095,729, dated Jun. 20, 1978, Ser. No. 714,951, Sep. 3, 1976. Application for reissue Jun. 24, 1980, Ser. No. 162,601

Int. Cl.[3] B26F *3/02*

U.S. Cl. 225—42 2 Claims



2. A dispenser for filter paper comprising a housing for enclosing

a roll of strip material, said housing having bottom and wall portions and a removable top portion, a slot in said wall portion, means connected to said wall portion adjacent said slot for attaching said housing to a smoke tester, and a cutting edge on said attaching means, said edge being parallel to said slot and spaced from said housing.

Re. 30,896

AIRCRAFT UNDERCARRIAGE SUSPENSION

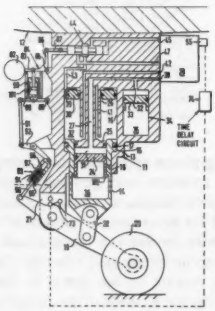
Stanley F. N. Jenkins, Tarporley; Roy Fairclough, Warrington, both of England; Brian A. Howard, Hawarden, Wales, and Frederick Miley, Widnes, England, assignors to Automotive Products Limited, Leamington Spa, England

Original No. 4,065,078, dated Dec. 27, 1977, Ser. No. 663,436, Mar. 3, 1976. Application for reissue Jul. 28, 1980, Ser. No. 172,702

Claims priority, application United Kingdom, Mar. 19, 1975, 11520/75

Int. Cl.[3] **B64C** *25/60*

U.S. Cl. 244—104 FP **20 Claims**



1. An aircraft undercarriage for supporting an aircraft structure comprising:

a ground contacting element;

a variable length liquid-filled strut operatively connected to the aircraft structure and the ground contacting element to support a proportion of the weight of the aircraft structure;

resilient means for controlling the length of said strut in dependence on the load supported thereby;

a first liquid-filled chamber in said strut from which liquid is displaced by upward movement of the ground contacting element relative to the aircraft structure;

a second liquid-filled chamber closed by a movable wall acting on said resilient means in a direction to increase the load thereon under the pressure of liquid displaced from said first chamber;

a valve block;

first and second flowpaths defined by the valve block connecting said first chamber and said second chamber;

first flow restricting means in said first flow path and second flow restricting means in said second flow path to damp movement of the ground contacting element relative to the aircraft structure;

a selector valve in the valve block operable to direct the displaced liquid selectively through each of said flow paths;

[and means responsive to] *and switch means operated by compression of said strut on* aircraft landing to control said selector valve such that said first flow path is operative while the aircraft is landing and the second flow path is brought into operation when the aircraft is taxiing.

Re. 30,897

ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH GAS EVACUATING MEANS

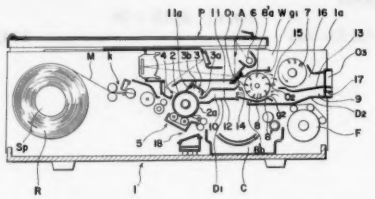
Shunji Yamamoto, Shinshiro; Koji Imaizumi, and Takashi Hikosaka, both of Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 4,178,092, dated Dec. 11, 1979, Ser. No. 814,831, Jul. 11, 1977. Division of Ser. No. 631,463, Nov. 12, 1975, abandoned. Application for reissue Jun. 24, 1980, Ser. No. 162,610

Claims priority, application Japan, Nov. 30, 1974, 49-137974; Dec. 4, 1974, 49-139735; Jan. 16, 1975, 50-8147

Int. Cl.[3] **G03G** *15/00*

U.S. Cl. 355—3 R **4 Claims**



1. An electrophotographic copying apparatus which comprises a rotatable photoreceptor member having a photoconductive surface for repeated formation of an electrostatic latent image of an original thereon, means disposed around said photoreceptor member and including corona charger means for uniformly charging said surface, exposure means for exposing said charged surface to image light of the original through an optical assembly including an illuminating light source so as to form the electrostatic latent image of the original thereon, and means for eliminating harmful gases generated by said corona charger means disposed within the copying apparatus, said means having suction means for drawing away said harmful gases adjacent to the corona charger means and said surface, said suction means including first duct means having one opening adjacent to said corona charger means, and suction fan means connected with said first duct means for generating air flow in the first duct means for drawing said harmful gases generated within said corona charger means through said opening of the first duct means and toward said suction fan, and means for supplying fresh air free from harmful gases toward said photoconductive surface opposed to said corona charger means, said fresh air supplying means including second duct means, one end of the second duct means being adjacent to said photoconductive surface opposed to said corona charger means.

Re 30,898

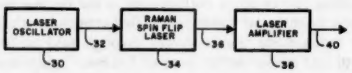
ger means. **INFRARED LASER SYSTEM**

Cyrus D. Cantrell, Richardson, Tex.; Robert J. Carbone, Johnson City, Tenn., and Ralph Cooper, Hayward, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Original No. 4,061,921, dated Dec. 6, 1977, Ser. No. 466,583, May 2, 1974. Application for reissue Mar. 16, 1979, Ser. No. 967,171

Int. Cl.[3] **H01J** *27/00;* **H01S** *3/00*

U.S. Cl. 307—426 **7 Claims**



14. A laser system for generating a laser signal at approximately 7.75 μm comprising:

CO laser means for producing a laser injection beam at a predetermined frequency;

H_2 scattering means for shifting said predetermined frequency of said laser injection beam to approximately 7.75 μm using rotational Raman transitions in H_2.

PLANT PATENTS

GRANTED APRIL 6, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,835

LIGHT PINK MINIATURE ROSE

Mark C. Spies, Arlington, Va., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 22, 1980, Ser. No. 189,796

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by Venetian pink blooms borne on a vigorous, compact, well rounded plant of attractive foliage.

4,836

***NERIUM INDICUM*—LITTLE RED VARIETY**

Richard C. Aldridge, Jr., Von Ormy, Tex., assignor to Aldridge Nursery, Inc., Von Ormy, Tex.

Filed Sep. 29, 1980, Ser. No. 192,093

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of *Nerium indicum* resulting from a cross of the Single Hardy Red variety and the Scarlet Beauty variety, substantially as shown and described, characterized by:

(a) a dwarf growth habit which produces an overall plant one-half or less the size of the Single Hardy Red variety in any given period and which after several years is approximately as broad as it is tall,

(b) the formation of deep scarlet red flowers which are smaller than those of the Single Hardy Red and Scarlet Beauty varieties and substantially identical in color to those of the Scarlet Beauty variety,

(c) the formation of leaves approximately one-half the size of the leaves of the Single Hardy Red variety, and

(d) superior hardiness when compared to the Scarlet Beauty variety.

PATENTS

GRANTED APR. 6, 1982

ERRATA

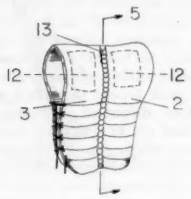
For CLASS	See PATENT NO.
574–011	4,322,942
141–070	4,323,090
428–036	4,323,400
376–353	4,323,428
525–237	4,323,485
525–054	4,323,486
525–054	4,323,487
528–032	4,323,488
524–788	4,323,489
523–409	4,323,490
524–144	4,323,491
524–388	4,323,492
524–451	4,323,493
524–858	4,323,494
524–156	4,323,495
528–499	4,323,519
524–545	4,323,603
219–213	4,323,607
373–101	4,323,717
373–073	4,323,718
370–102	4,323,790
372–046	4,323,856
372–002	4,323,857
372–107	4,323,858
372–046	4,323,859
372–032	4,323,860
367–040	4,323,876
346–074	4,323,933

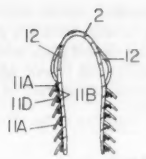
PATENTS

GRANTED APRIL 6, 1982

GENERAL AND MECHANICAL

4,322,858
PROTECTIVE GARMENTS FOR FOOTBALL PLAYERS
Huey Douglas, Baton Rouge, La., assignor to Douglas Equipment Manufacturing Co., Baton Rouge, La.
Filed Sep. 17, 1979, Ser. No. 76,074
Int. Cl.[3] A41D *13/00*
U.S. Cl. 2—2 **1 Claim**





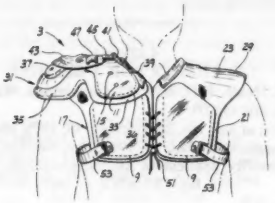
1. A protective jacket to be worn by a person to protect the rib cage of said person, comprising:

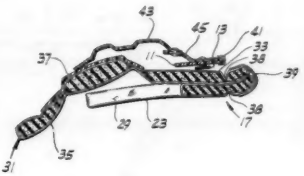
(a) liner cloth pieces adjustably attached to one another and provided with arm openings through which the arms of said person can pass, said cloth pieces fitting over the shoulders of said person and extending below the rib cage of said person; and

(b) flap assemblies having over-lapping, flexible convex shaped flaps hingedly attached to said liner cloth pieces, said flaps being arranged in five columns, two of said columns being positioned over that portion of said rib cage in front of said person, two other of said columns being positioned over that portion of said rib cage in back of said person and a fifth column being positioned to fit over the spinal column of said person.

4,322,859
SHOULDER PAD
Hal D. Mitchell, Rolla, Mo., assignor to A-T-O Inc., Willoughby, Ohio
Filed Apr. 25, 1980, Ser. No. 143,900
Int. Cl.[3] A41D *13/00*
U.S. Cl. 2—2 **12 Claims**

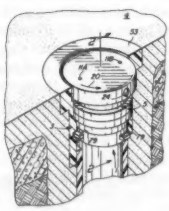
1. A shoulder pad for football players comprising a left-hand member adapted to fit over the left shoulder and a right-hand member adapted to fit over the right shoulder, each of said members being of generally inverted U-shape as viewed from the side and comprising a chestplate, a backplate and an arch at the top of the shoulder adjacent the neck of the wearer, said arches being laterally spaced to provide an opening for the neck of the wearer with the spacing such that said arches lie adjacent and relatively close to the neck, said chestplate, backplate and arch each comprising a separate discrete piece of relatively rigid material, said arch being mounted for upward swinging movement with respect to the chestplate and backplate about a hinge line extending in front to back direction with respect to the shoulder pad over the shoulder, whereby freedom is provided for raising the arms above a horizontal





position by permitting upward movement of the arm at the shoulder without substantial interference from the arch.

4,322,860
POOL CLEANING HEAD WITH ROTARY POP-UP JET PRODUCING ELEMENT
Henry D. Gould, Phoenix, Ariz., assignor to Shasta Industries, Inc., Phoenix, Ariz.
Filed Oct. 6, 1980, Ser. No. 194,679
Int. Cl.[3] E04H *3/20*
U.S. Cl. 4—490 **16 Claims**



1. A cleaning head for installation in a housing disposed in an under-liquid surface of a liquid container such as a swimming pool, the housing having an upper surface flush with the under-liquid surface, the housing receiving a pressurized liquid, the pressure of which is intermittently or periodically cycled between a relatively low pressure and a relatively high pressure, said cleaning head comprising in combination:

a. stationary means open at upper and lower ends thereof for removable connection in sealed relation to said housing;

pop-up jet producing means, having an outlet opening, rotatably, indexably disposed in said stationary means for moving outwardly from the under-liquid surface in response to said relatively high pressure to expose said outlet opening

and produce a concentrated, high-velocity liquid jet along said under-liquid surface from said outlet opening; and

c. retracting means connected to both said stationary means and said pop-up jet producing means for retracting said pop-up jet producing means when said liquid pressure is cycled from said relatively high pressure to said relatively low pressure, said pop-up jet producing means rotating to successive fixed positions in response to said cycling, thereby producing a plurality of successive concentrated, high velocity liquid jets to clean a circular pattern around said cleaning head.

4,322,861

ENTRANCE FOR A BEEHIVE

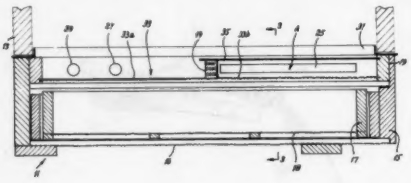
Kenneth T. Healy, P.O. Box 131, Cannington, Western Australia, Australia (6107)

Continuation of Ser. No. 28,644, Apr. 10, 1979, abandoned. This application Jan. 13, 1981, Ser. No. 224,683

Claims priority, application Australia, Apr. 14, 1978, PD4036

Int. Cl.³ A01K *47/06*

U.S. Cl. 6—4 R **22 Claims**



15. A pollen-collecting entrance structure for a beehive comprising a base for supporting a beehive, said base defining a space located below the beehive and in open communication therewith through the bottom of said beehive, a pollen collecting drawer slidably supported in the bottom of said space and removable transversely from said base, an accessway through a wall of said base providing access for bees from the exterior of said base to the area above said pollen-collecting drawer, and a pollen extracting drawer slidably supported in said base and removable transversely therefrom, said pollen-extracting drawer comprising means defining an area in communication with said accessway whereby bees may enter said area through said accessway, a perforate member providing communication between said area and the portion of said space in communication with the open bottom of the beehive through which at least a portion of the bees entering the open bottom of the beehive must pass, the openings in said perforate member being sized so that pollen is extracted from the bees passing therethrough, and a floor extending horizontally and located between said pollen-collecting receptacle and the bottom of the beehive, said floor having a grid extending beneath said perforate member and above said pollen-collecting receptacle for permitting pollen extracted by the passage of bees through said perforate member to fall into said pollen-collecting receptacle.

4,322,862

APPARATUS AND METHOD FOR FEEDING BEES

Irvin C. Beuthling, Roseville, Minn., assignor to Gary J. Beuthling and John A. Miller, a part interest

Filed Nov. 24, 1980, Ser. No. 209,837

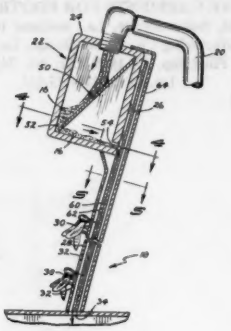
Int. Cl.³ A01K *53/00*

U.S. Cl. 6—5 **14 Claims**

14. A method for feeding bees including the steps of:

A. causing a bee fee liquid to flow down a plane inclined at an angle to the horizontal;

B. providing an otherwise imperforate liquid access screen having holes therethrough of dimension to permit penetration through said holes by the proboscis of each of the bees to be fed, and to prevent penetration of the remainder of the bee therethrough, said screen having sufficient imperforate surface around each hole to support each bee on one side of said screen while its proboscis protrudes through one hole to the other side and to prevent contact between any part of such feeding bee and the periphery of any other hole;



C. situating said screen in parallel, spaced relation to said inclined plane at a distance to allow each bee proboscis to access bee feed liquid flowing on said plane while preventing said liquid from contacting said screen; and

D. permitting bees to have access to a surface of said screen opposite said inclined plane.

4,322,863

MACHINE FOR LASTING HEEL SEAT PORTIONS OF SHOES

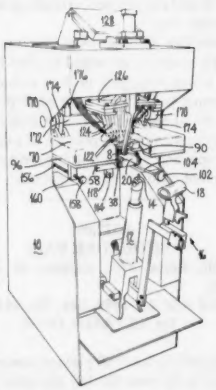
Gerhard Giebel, Bad Soden, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Jul. 21, 1980, Ser. No. 170,690

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929536

Int. Cl.³ A43D *21/00*

U.S. Cl. 12—12.5 **16 Claims**



1. A machine for lasting heel seat portions of shoes, comprising a shoe support for supporting, bottom uppermost, a shoe comprising an upper carried on a last and an insole held against the last bottom, a heel band for clampingly engaging the heel end of a shoe supported by the shoe support, a wiper assembly for wiping marginal portions of the shoe upper, at the heel seat region thereof, inwardly over, and pressing them against, corresponding marginal portions of the insole, and fastener inserting means effective to cause said lasting marginal portions to be secured, when pressed as aforesaid, to said corre-

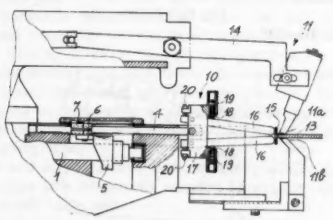
sponding marginal portions of the insole, wherein the wiper assembly includes a pair of wiper plates, fluid pressure operated means for effecting movement of the wiper plates in a direction extending lengthwise of the shoe bottom, and cam means effective, as such lengthwise movement is effected, to cause pivotal movement of the wiper plates to take place about an axis extending normally to the direction of lengthwise movement thus to cause the wiper plates to effect an in-wiping movement in relation to the shoe bottom, and further wherein each wiper plate has a row of apertures formed therein, adjacent a leading edge thereof, through which apertures fasteners can be driven by the fastener inserting means to secure the lasting marginal portions of the upper as aforesaid, the machine further comprising control means by which the operation of the fluid pressure operated means can be controlled, said control means comprising two cooperating abutment members, one of which is movable, under the action of the fluid pressure operated means, as lengthwise movement of the wiper plates is effected as aforesaid, from a position spaced from the other abutment member into engagement therewith, such engagement being effective to cause the action of the fluid pressure operated means to be terminated thereby causing the lengthwise movement of the wiper plates, and thus also the in-wiping movement thereof, to be arrested and the control means further comprising adjustment means whereby, when the machine is in a rest condition, the distance between the abutment members can be varied thus to enable the position to which the wiper plates (and the apertures formed therein through which fasteners can be driven) are moved when lengthwise and in-wiping movement of said plates is subsequently effected as aforesaid to be set in a desired relationship with the shoe bottom.

4,322,864

BINDING MACHINE FOR THE APPLICATION OF A STRIP OF FLEXIBLE MATERIAL AROUND THE OUTLINE OF THIN ARTICLES, PARTICULARLY FOR EDGING PARTS FOR BOOTS AND SHOES

Alberto Bocca, and Mario Pagani, both of Vigevano, Italy, assignors to Sagitta Officina Meccanica S.p.A., Italy

Continuation-in-part of Ser. No. 891,756, Mar. 30, 1978, abandoned. This application Nov. 12, 1980, Ser. No. 205,905
Claims priority, application Italy, Apr. 1, 1977, 22031 A/77
Int. Cl.³ A43D *43/06*; B32B *3/04*; F16H *21/00*
U.S. Cl. 12—24.5 **5 Claims**



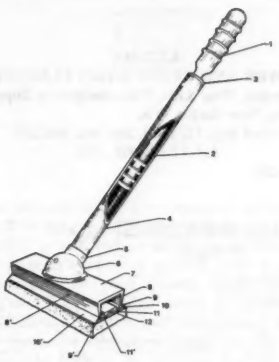
1. A binding machine for the application of an edging strip of flexible material around an edge of thin articles particularly for edging soles of boots and shoes comprising, a hollow shaft oscillating about its axis, a pressure and transportation group, driven by said shaft, said pressure and transportation group comprising a hammer shaped part and an anvil shaped part, a first rod in the hollow shaft coaxial therewith driven reciprocably longitudinally to control pressing of the strip in a folded condition, and a second rod parallel to said hollow shaft driven reciprocably longitudinally, a fork actuated by said second rod to fold the strip partly above and partly below an edge of a thin article before the pressing operation, characterized in that said hollow shaft is connected with said hammer and anvil shaped parts, a support arm mounted on the hollow shaft connecting said shaft to said hammer and anvil shaped parts, a leverage device comprising a lever centrally pivoted on a pivot supported by the support arm, a sleeve, said lever carrying on one end said hammer shaped part, and on the other end being articulated to said sleeve, said sleeve being slidingly mounted on said first rod, and another lever, centrally pivoted on said pivot, a link rod, said another lever carrying on one end the said anvil shaped part and the other end being articulated to said link rod at its lower extremity, the upper extremity of said link rod being articulated to an end of a bell crank lever pivoted on the support arm and having the other end articulated with said first rod, and said bell crank lever; the first rod, the second rod and the hollow shaft being connected to a driving shaft for a common, synchronized drive and control.

4,322,865

PNEUMATIC SPONGE MOP

Robert F. von Meyer, 219 W. 104th St., New York, N.Y. 10025

Filed Sep. 18, 1980, Ser. No. 188,544
Int. Cl.³ A47L *13/146*
U.S. Cl. 15—119 A **6 Claims**



1. A pneumatic sponge mop comprising an airtight tubular handle terminating in an air chamber with a means of creating a vacuum therein whereupon a movable bottom in the air chamber will oscillate upward in response to the vacuum, an elongate boxlike wringer with a rigid top, flexible walls, and an articulated bottom capable of collapsing upward when pulled by a linkage to the movable bottom of the air chamber, and in so doing axially folding and compressing an elongate mop head attached to it by quick release fasteners.

4,322,866

POLISHER MOUNTING MEANS

Gina Brazzale, Norwood, South Australia, Australia, assignor to Anthony John Brazzale, Norwood, South Australia, Australia

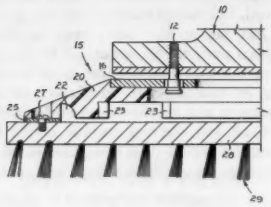
Filed Jun. 19, 1980, Ser. No. 160,982
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—180 **9 Claims**

1. Polisher mounting means for mounting a floor polisher brush or pad to coupling means on a floor polisher shaft, comprising:

an annular discoid member formed of elastomeric material having a durometer hardness of between 60 and 90 (shore A), the discoid member having a relatively thick central zone which grades down through an intermediate zone to a peripheral zone, and is relatively thin where the intermediate zone joins the peripheral zone,

a central metal boss on the central zone of the discoid member embodying attachment means cooperable with the coupling means,

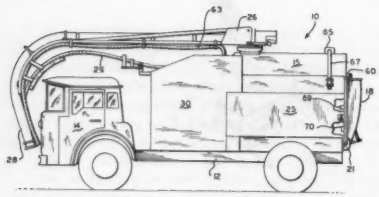
a thin annular metal member on the underside of the discoid member and extending around the peripheral zone, and



securing means for securing the brush or pad to the annular metal member.

4,322,867
Patent Not Issued For This Number

4,322,868
SEWER AND CATCH BASIN CLEANER
James C. Wurster, West Allis, Wis., assignor to Super Products Corporation, New Berlin, Wis.
Filed Sep. 11, 1980, Ser. No. 186,235
Int. Cl.³ B08B 3/02
U.S. Cl. 15—302 **12 Claims**



1. In a combination sewer and catch basin cleaner of the type including water injection and vacuum loading systems, said water injection system comprising a water tank, a water hose and a first pump means for delivering water under pressure through said hose, said vacuum system comprising a body, a vacuum hose and a vacuum pump downstream of said vacuum hose and body for vacuum loading material into said body through said vacuum hose, said cleaner also including recirculation pump means for pumping water from said body into said water tank and filtration means for said water whereby the water tank may be replenished from said body, the improvement in said cleaner comprising:

valve means downstream of said recirculation pump means, said valve means having an inlet and two outlets, discharge hose means coupled to a first outlet, the other of said outlets being coupled by conduit means to said water tank.

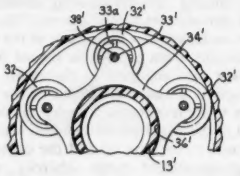
4,322,869
WHEEL ASSEMBLY
Gerald J. Jordan, P.O. Box 93, Marceline, Mo. 64658
Filed Sep. 8, 1980, Ser. No. 185,108
Int. Cl.³ A47B 91/00
U.S. Cl. 16—46 **15 Claims**

1. A freely rotatable wheel assembly, comprising:

a one-piece freely-rotatable annular rim having a central opening extending therethrough in coaxial alignment with the rotational axis of said rim, said rim being constructed of a hard low-friction material and having an inner annular surface which surrounds said opening for defining an outer bearing race;

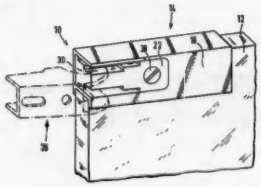
bearing means positioned within said central opening for creating a low-friction rolling engagement between said rim and a shaft which is coaxially and centrally positionable within said opening, said bearing means including a plurality of cylindrical rollers which are constructed of hard low-friction nonmetallic material, said rollers being positioned within said central opening and being uniformly angularly spaced apart around said rotational axis so that the axes of said rollers define a circular locus which is generated about said rotational axis, said rollers being individually disposed in direct rolling engagement with said outer bearing race and with an inner annular bearing race defined on the exterior periphery of the shaft;

a pair of coaxially aligned but axially spaced annular retainers disposed concentrically with said central opening adjacent the opposite ends thereof so that said plurality of cylindrical rollers are disposed axially between said retainers, said retainers being freely rotatable relative to both said rim and said shaft; and



an axle associated with each said roller for supporting same on and between said retainers, each said axle extending parallel to said rotational axis and having the opposite ends thereof freely rotatably supported on said retainers, each said axle also having a respective said roller freely rotatably supported thereon.

4,322,870
HINGE FOR ALL-GLASS DOORS OF CABINETS
Gerhard W. Lautenschläger, Brensbach-Wersau, Fed. Rep. of Germany, assignor to Karl Lautenschläger KG., Mobelbeschlagfabrik, Odenwald, Fed. Rep. of Germany
Filed Jul. 26, 1978, Ser. No. 927,966
Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2739939
Int. Cl.³ E05D 7/04
U.S. Cl. 16—235 **9 Claims**



1. A hinge for a glass door on a cabinet having a supporting wall, said hinge having a first part to be fastened to the door, and a second part to be fastened to said supporting wall, and a pivot axis, said first part comprising an elongated metal fitting to be disposed in a corner area of the glass door, overlapping the margin thereof, and having a recess which is open on that side which is to be located on the inside of the door and at the end to be facing the supporting wall, a mating insert of metal fastened releasably in said recess, said second hinge part being pivoted on said insert and in the form of an elongated supporting arm of approximately U-shaped cross section, which is adjustably attached to a mounting plate to be fastened to the supporting wall of the cabinet, said recess in said fitting having in plan approximately the shape of an elongated rectangle whose longer sides are at right angles to the hinge pivot axis,

said insert having a slightly reduced height in comparison with the clear height measured between the longer rectangle side of the recess, so that between said fitting and said insert mounted therein slots extending at right angles to the hinge pivot axis are formed, into which engage extended sides of the elongated supporting arm pivotingly articulated to the insert at their free end area.

4,322,871

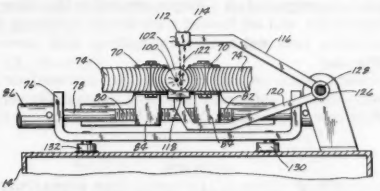
LINK CUTTER

Ray T. Townsend, Des Moines, and Floyd R. Ladd, West Des Moines, both of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed May 29, 1980, Ser. No. 154,480

Int. Cl.³ A22C *11/00*

U.S. Cl. 17—1 F **8 Claims**



1. An apparatus for separating a plurality of links interconnected by twisted casing sections, comprising

a support frame including a cutting zone having opposite upstream and downstream sides,

a first conveyor on the upstream side of said cutting zone for sequentially conveying joined links to said cutting zone,

a second conveyor on the opposite downstream side of said cutting zone for receiving links from said first conveyor, said second conveyor being operable at a faster rate of travel than said first conveyor for stretching the twisted casing section between links at said cutting zone,

a knife movably supported in said cutting zone for severing the stretched twisted casing section,

a knife drive means, and

a sensor positioned on the upstream side of said cutting zone for detecting the presence of a twisted casing section between a pair of links, said sensor including a source of electromagnetic waves directed across the path of said links and means for sensing those waves which pass between links adjacent the twisted casing section,

said sensing means being operatively connected to said knife drive means for cutting movement of the knife through the sensed twisted casing section upon movement of said twisted casing section downstream from said sensor to said cutting zone,

said first and second conveyors each comprising a pair of continuous belt conveyors adapted to engage opposite sides of said links, and

each pair of continuous belt conveyors including a plurality of cupped rollers and a pair of continuous belts trained about said cupped rollers to define a partially tubular conveying sleeve between said belts.

4,322,872

APPARATUS FOR BREAKING THE NECK OF A FOWL

Pieter Meyn, P.O. Box 16, 1510 AA Oostzaan, Netherlands

Filed Jul. 9, 1980, Ser. No. 167,197

Claims priority, application Netherlands, Jul. 19, 1979, 7905612

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—12 **6 Claims**

1. Apparatus for breaking the neck of a defeathered headless bird, which hangs by the legs from a shackle of an overhead conveyor, comprising:

a frame;

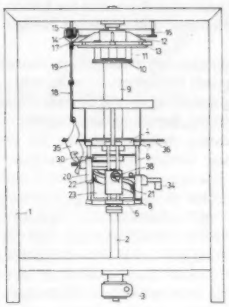
a support movably supported by said frame;

first moving means for moving said support along in synchronisation with said overhead conveyor during part of the path thereof;

second moving means for additionally moving said support up and down relative to said conveyor;

a forked clamping member carried by said support and adapted to receive the neck of said bird, one of the fork legs of said clamping member being axially slidable relative to said support;

a pressure bar attached to the outer end of said slidable leg and laterally extending towards the other leg of said clamping member; and



means for controlling the movements of said support and said slidable leg in such manner that the neck of said bird is received in said forked clamping member when said support is in its lowermost position relative to said overhead conveyor and said slidable leg is fully extended relative to said support, after which said support is moved to its uppermost position and said slidable leg is pulled back towards said support, so that the neck is pressed into said clamping member by said pressure bar and broken thereby, then said support is moved down again, so that said broken neck is at least partially stripped out of the skin and finally said slidable leg is extended again.

4,322,873

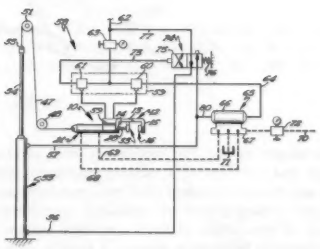
HIND LEG SKINNER

John G. Lunn, Austin, Minn., assignor to Geo. A. Hormel & Company, Austin, Minn.

Filed Oct. 20, 1980, Ser. No. 199,032

Int. Cl.³ A22B *5/16*

U.S. Cl. 17—21 **1 Claim**



1. Apparatus for pulling skin from the hind legs of hog carcasses, comprising:

a clamping device including a support frame;

a fixed jaw on said support frame;

a first fluid pressure unit including a cylinder connected to a

source of fluid under pressure, a piston rod movable in said cylinder between retracted and extended positions;

a movable jaw secured to the end of said piston rod and being movable therewith, said movable jaw being spaced from said fixed jaw when the piston rod is in the retracted position, and being disposed in close proximal clamping relation with the fixed jaw when the piston rod is in the retracted position, and being disposed in close proximal clamping relation with the fixed jaw when the piston rod is in the extended position;

a second fluid pressure including a cylinder and a piston rod movable in said cylinder between retracted and extended positions;

an elongate, flexible member interconnected with said clamping device and the piston rod of said second fluid pressure unit whereby when the piston rod of the second unit is retracted, said clamping device will be retracted; and

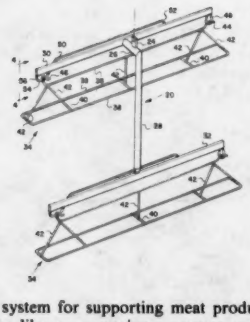
A control mechanism arranged in controlling relation with respect to said fluid pressure units, said control mechanism including actuating means on said clamping device selectively operable between clamping and released conditions, said actuating means when in the clamping condition causing said further first fluid pressure unit to move the movable jaw into clamping relation with said fixed jaw to clamp the skin of the hind leg of an animal carcass therebetween, and simultaneously causing said second fluid pressure unit to retract and pull said clamping device and the skin clamped thereby, said control mechanism being operable to cause the piston rod of said second fluid pressure unit to automatically extend after completion of the retraction stroke, said actuating means when in the released condition causing the piston rod of said first fluid pressure unit to retract to release the clamped portion of the skin clamped thereby.

4,322,874

MULTIPLE STICK FOR SMOKE HOUSE

Guy E. Buller-Colthurst, Rexdale, Canada, assignor to Knud Simonsen Industries Limited, Rexdale, Canada

Filed May 16, 1980, Ser. No. 150,303
Int. Cl.³ A22C *15/00*
U.S. Cl. 17—44.4 **4 Claims**



1. A hanger system for supporting meat products such as sausages and the like on a moving conveyor system during curing and the like wherein such meat products are supported on hangers which in turn are releasably carried transversely of the path of movement of such conveyor system by support bars suspended from such conveyor system, said hanger system comprising:

overhead conveyor means defining a conveyor movement path;

a plurality of carriers on said overhead conveyor means in spaced apart relation along said path, each of said carriers comprising;

a generally horizontal upper cross member having two ends, extending lengthwise along such conveyor path;

a generally vertical leg portion extending downwardly from one end of said cross member;

a lower transverse support bar attached to the lower end of said leg portion extending transversely of such conveyor path;

an upper transverse support bar attached to the free end of said cross member remote from said leg portion extending transversely of such conveyor path, thereby locating said upper support bar vertically spaced apart, and spaced apart along such conveyor path relative to such lower support bar;

attachment means on said support bars for releasably securing hangers thereto so that meat products supported on a said hanger secured to one of said support bars are suspended in vertically spaced apart relationship to meat products supported on a hanger secured to the other said support bar, and are located transversely relative to such conveyor path and spaced apart along such conveyor path; and,

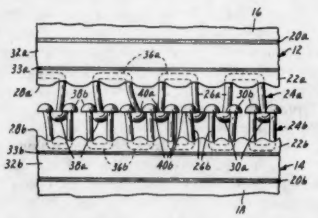
suspension means on said cross member intermediate said ends whereby said carrier may hang substantially vertical when carrying meat products on both said support bars.

4,322,875

TWO STRIP MATERIALS USED FOR FORMING FASTENERS

James N. Brown, and Melvin O. Kalleberg, both of St. Paul, Minn., assignors to Minnesota Mining and Manfacturing Company, St. Paul, Minn.

Filed Mar. 31, 1980, Ser. No. 135,339
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—204 **3 Claims**



1. Two strip materials from which lengths may be severed to form portions of a fastener, said strip materials each having a known structure comprising a polymeric bonding layer; and a multiplicity of flexible, resilient, generally U-shaped monofilaments, each monofilament including a central bight portion embedded in the bonding layer, two stem portions extending from the opposire ends of said bight portion and projecting generally normal to an exposed major surface of the bonding layer, and enlarged, generally circular heads at the ends of said stem portions opposite said bight portion, each of the heads having a cam surface opposite its supporting stem portion adapted for engagement with the cam surfaces of heads along the other strip material to produce deflection of the stem portions and to afford movement of the heads on the stem portions past each other, and having a latching surface opposite said cam surface adapted to engage a similar latching surface on another head; the bight portions of said U-shaped monofilaments on each strip material being disposed in a rectangular array and spaced to afford movement of the heads of the strip materials past and into releasable engagement with each other, said strip materials being improved to restrict relative movement between the engaged portions in directions parallel to said bonding layers in that the stem portions on each of the strip materials are about equally spaced in each direction to provide numbers of stem portions per unit length on one strip

material that are different from and not a multiple of or evenly divisible by the number of stem portions per unit length on the other strip material in either direction so that when portions of the strip materials are engaged with the rows aligned, certain of the stem portions will always interfere with each other to restrict said relative movement between the portions of the strip materials.

4,322,876

DEVICE FOR INSERTING A SHADOW MASK INTO THE FACEPLATE OF A COLOR-PICTURE TUBE

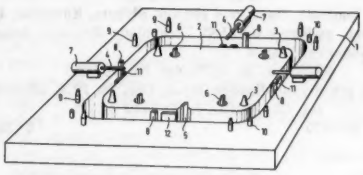
Peter Schmidt, Denkendorf, and Emil Mühlberger, Esslingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation. New York, N.Y.

Continuation of Ser. No. 63,013, Aug. 2, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,171

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1978, 2837381

Int. Cl.³ H01J *9/18*

U.S. Cl. 29—25.19 **11 Claims**



1. A device for inserting a substantially rectangular shadow mask into a substantially rectangular faceplate of a color picture tube comprising:

a first horizontal table having an upper horizontal surface, a lower horizontal surface and a central cut out therein, said faceplate having N studs each secured to and extending inwardly from the inner surface of a different side of said faceplate, said N studs being employed as reference points for said device, where N is an integer greater than two;

a second horizontal table having an upper horizontal surface and a lower horizontal surface disposed in said cut out, said shadow mask having a frame and N leaf springs on the external surface of said frame, each of said N leaf springs being positioned on said frame to be associated with one of said N studs and having a hole for receiving said associated one of said N studs and a first positioning notch to enable said device to employ said N leaf springs as reference members;

one of said first and second tables being fixed and the other of said first and second tables being vertically movable such that when said shadow mask is positioned on said second table said upper surfaces of said first and second tables are in the same plane and when said faceplate is positioned on said first table, after positioning said shadow mask on said second table, said second table is lower than said first table;

four first guide members projecting upwardly from said upper surface of said second table, each of said first guide members being shaped like truncated cones to engage the inside of said frame when said shadow mask is placed on said second table to preposition said shadow mask on said second table; and

at least three centering members each fastened to said upper surface of said first table in association with a different one of said N leaf springs, each of said centering members being movable by a means in a plane parallel to said upper surface of said first and second tables for fine positioning of said shadow mask on said second table, said means moving each of said centering members against the outer circumference of said frame to engage an associated one of said first notches and moving each of said centering members outside said shadow mask and said faceplate region when said centering members are in their rest position.

4,322,877

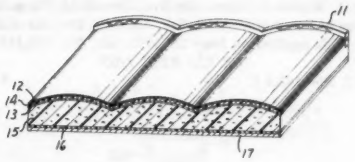
METHOD OF MAKING PIEZOELECTRIC POLYMERIC ACOUSTIC TRANSDUCER

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 944,207, Sep. 20, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,239

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **7 Claims**



1. A method of making a flexible piezoelectric acoustic transducer tape which is thin enough to be convolutely wound on itself in roll form and when extended is adapted for placement on a lengthy supportive surface, said method comprising:

I. heat forming a long, narrow, thin, flexible layer of poled piezoelectric thermoplastic film material having two extended surfaces and a poled direction generally perpendicular to said extended surfaces of said film on a surface having a plurality of repetitively curved elements disposed in an area corresponding to one of said extended surfaces to provide a comparable plurality of repetitively curved segments in said film;

II. applying a first and second continuous long, thin, narrow, flexible conductive electrode in a surface-to-surface contact with respective sides of poled piezoelectric layer and coextensive therewith;

III. adhering to said first extended surface in at least a plurality of positions a long, narrow layer of flexible resilient material having first and second extended surfaces, with said first extended surface of said resilient material in contact with the second conductive electrode along substantially the entire length thereof; and

IV. applying one or more adhesive portions coextensive with at least a portion of said second extended surface of said resilient material.

4,322,878

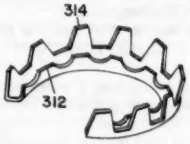
BEARING COMPONENTS AND METHOD OF MAKING SAME

Henry A. Warchol, 2 Sackville Ave., Westfield, Mass. 01085

Division of Ser. No. 876,899, Feb. 13, 1978, Pat. No. 4,212,095. This application May 13, 1980, Ser. No. 149,326

Int. Cl.³ B21K *1/05*

U.S. Cl. 29—148.4 C **4 Claims**



1. A method of making a bearing component comprising the steps:

forming an elongated metallic strip into a circular tubular

ring with the opposite end edges of the strip being brought into confrontation and fused together,

forming the ring into a frustoconical configuration with one edge of the ring defining a small circumference and one edge of the ring defining a large circumference and with the ring retaining the original circular ring diameter,

flattening the frustoconical configuration into a single plane and turning the opposite edges of the flattened ring in planes normal to the plane of the flattened ring and in parallelism with each other.

4,322,879

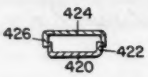
BEARING COMPONENTS AND METHODS OF MAKING SAME

Henry A. Warchol, 2 Sackville Ave., Westfield, Mass. 01085

Division of Ser. No. 876,899, Feb. 13, 1978, Pat. No. 4,212,095. This application May 13, 1980, Ser. No. 149,318

Int. Cl.³ B21K *1/05*

U.S. Cl. 29—148.4 C **3 Claims**



1. A method of making a bearing cage comprising the steps of:

forming a first outside strip of flat metallic stock with opposite side face portions turned inwardly in parallel planes normal to the plane of the main face portion,

forming the main face portion of the first outside strip with a plurality of equi-spaced ball or roller openings therethrough,

forming the first outside strip into a first annular ring with the confronting end edges fused together and with the main face portion defining a first cylindrical annulus of a certain outside diameter,

forming a second inside strip of flat metallic stock with opposite side face portions turned outwardly in parallel planes normal to the plane of the main face portion,

forming the main face portion of the second inside strip with a plurality of equi-spaced ball or roller openings therethrough,

forming the second inside strip into a second annular ring with the confronting end edges fused together and with the main face portion defining a second cylindrical annulus of an inner diameter less than the certain outer diameter of the first annulus,

joining the respective side face portions of the main face portion of the first and second annular rings to each other with the outside side faces of the inside ring being nestably received inside of the inside side faces of the outside ring in defining a pair of coaxial annuli equally spaced as to each other throughout their circumferences.

4,322,880

METHOD OF FABRICATING A PRESTRESSED CAST IRON VESSEL

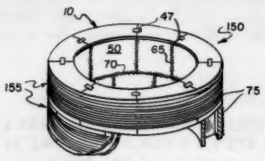
Robert F. Lampe, Bethel Park, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 9, 1980, Ser. No. 138,804

Int. Cl.³ B21D *39/00*

U.S. Cl. 29—452 **20 Claims**

1. A method of fabricating a prestressed cast iron vessel comprising: casting body segments; forming liner segments each complementary in shape to a selected one of the body segments; mounting each formed liner segment to the selected one of the body segments; forming a plurality of ring assemblies by assembling combined liner and body segments into a ring; welding the liner segments of each ring together forming a unitary liner ring; providing the outer surface of the cast iron body segments of each ring with tensioned members to compress and complete each ring assembly; stacking ring assemblies to form the vessel; welding adjacent unitary liner rings



together; providing a head to cover the top ring assembly to cover the vessel; and providing axially extending tendons under tension to retain the head in place under pressure.

4,322,881

METHOD FOR MANUFACTURING SEMICONDUCTOR MEMORY DEVICES

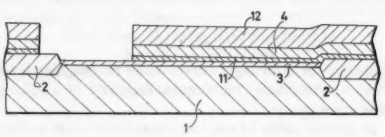
Tatsuya Enomoto, Itami, and Hiroshi Shibata, Kawasaki, both of Japan, assignors to VLSI Technology Research Association, Kanagawa, Japan

Filed Dec. 26, 1979, Ser. No. 107,286

Claims priority, application Japan, Dec. 26, 1978, 53-163808

Int. Cl.³ H01L *29/78*; B01J *17/00*

U.S. Cl. 29—571 **8 Claims**



1. A method for producing a semiconductor memory device comprising the steps of:

providing a wafer of silicon semiconductor material containing an impurity of a first conductivity type;

forming a thick oxide layer in a predetermined pattern on a surface of said wafer;

thermally oxidizing said surface to form a thin oxide layer;

forming a layer of silicon nitride over at least portions of said thick oxide layer and said thin oxide layer;

forming a layer of polycrystalline silicon upon said layer of silicon nitride;

etching away first portions of said layer of silicon nitride and first portions of said layer of polycrystalline silicon in a predetermined pattern;

etching away second portions of said layer of polycrystalline silicon to partially expose second portions of said layer of silicon nitride;

removing first portions of said thin oxide layer in areas where said first portions of said layer of polycrystalline silicon was etched away to expose first portions of said surface of said wafer;

diffusing impurities of a second conductivity type into said first portions of said surface;

providing a layer of thermal oxide on said surface of said wafer by using said second portions of said layer of silicon nitride as a mask for oxidation;

etching away said second portions of said silicon nitride layer extending beyond said polycrystalline silicon layer;

etching away portions of said thin oxide layer in areas where said second portions of said silicon nitride layer were etched away to expose a second portion of said surface of said wafer;

thermally oxidizing said wafer to form a thin oxide film on said second portion on said surface;

providing contact holes through said layer of thermal oxide; and

forming conductive interconnection layers extending into said contact holes.

4,322,882

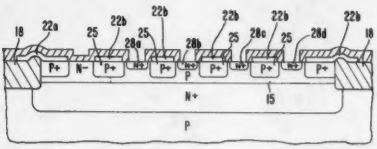
METHOD FOR MAKING AN INTEGRATED INJECTION LOGIC STRUCTURE INCLUDING A SELF-ALIGNED BASE CONTACT

Madhukar D. Vora, Los Gatos, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Feb. 4, 1980, Ser. No. 118,178

Int. Cl.³ H01L *21/22*

U.S. Cl. 29—571 **16 Claims**



1. A method for making an integrated injection logic device in a pocket of first conductivity type epitaxial layer separated from a substrate of opposite conductivity type by an intervening region of first conductivity type, the pocket surrounded by insulating material extending to contact said intervening region, the method comprising:

introducing an opposite conductivity type impurity into a first portion of the epitaxial layer;

depositing first material which includes opposite conductivity type impurity over a second portion of the epitaxial layer, the second portion including at least part of the first portion;

treating the first material to cause at least some of the opposite conductivity type impurity to enter the epitaxial layer; and

introducing first conductivity type impurity into a third portion of the epitaxial layer, the third portion including at least part of the first portion and none of the second portion.

4,322,883

SELF-ALIGNED METAL PROCESS FOR INTEGRATED INJECTION LOGIC INTEGRATED CIRCUITS

Shakir A. Abbas, Wappingers Falls, and Ingrid E. Magdo, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 8, 1980, Ser. No. 167,173

Int. Cl.³ H01L *21/223, 21/302*

U.S. Cl. 29—578 **13 Claims**

1. A method for forming an integrated injection logic integrated circuit having a pattern of narrow dimensioned dielectric regions on a monocrystalline silicon body comprising:

providing said silicon body;

forming a first insulating layer on a major surface of said body;

removing said first insulating layer in areas designated to contain integrated injection logic devices of said integrated circuits;

forming over said major surface a highly doped polycrystalline silicon layer of conductivity type opposite to that of said body;

forming openings in said polycrystalline silicon layer by reactive ion etching in the areas designated as the base of the lateral injector transistor of said integrated circuit which results in the structure having substantially horizontal surfaces and substantially vertical surfaces;

forming a second insulating layer on both said substantially horizontal surfaces and said substantially vertical surfaces;

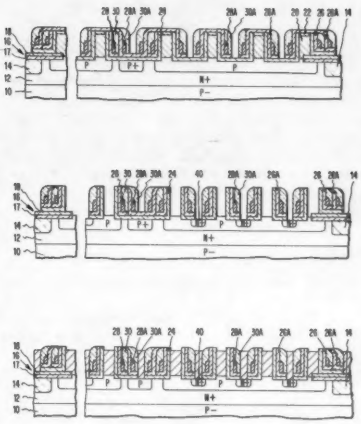
reactive ion etching said second insulating layer to substantially remove the said second insulating layer from said horizontal surfaces and to provide said narrow dimensioned dielectric regions on said silicon body in said areas designated the base of the lateral injector transistor;

forming said base of the lateral injector transistor;

annealing the structure to fully form the said base of the said injector transistor, and to drive into the said body the opposite type impurities from said polycrystalline silicon layer and thereby forming the base regions for the vertical transistors of said integrated injection logic integrated circuit;

forming additional openings in said polycrystalline silicon layer in areas designated as collector regions for said vertical transistors which results in the structure having substantially horizontal surfaces and substantially vertical surfaces;

forming a third insulating layer on both said substantially horizontal surfaces and said substantially vertical surfaces;



reactive ion etching said third insulating layer to substantially remove said third insulating layer from said horizontal surfaces and to provide additional said narrow dimensioned dielectric regions on said silicon bodies in said areas designated as collector regions for said vertical transistors;

forming said collector regions of said vertical transistors;

removing the remaining said polycrystalline silicon layer by etching to leave said pattern of narrow dimensioned on the said major surface; and

forming a conductive layer on said major surface of said body which has portions thereof electrically separated by said narrow dielectric regions for contacting in self-alignment the said base of the lateral transistor, said base and collector regions of said vertical transistor, and said silicon body.

4,322,884

METHOD OF INTRODUCING AN ANTI-MICROPHONY SPONGE INTO AN AIR-CORED COIL

Cesare Chiecchi, Castiraga Vidardo, Italy, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 94,627

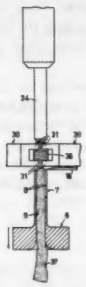
Claims priority, application Italy, Nov. 17, 1978, 29904 A/78

Int. Cl.³ H01F *41/00*

U.S. Cl. 29—602 R **3 Claims**

1. A method of introducing an anti-microphony sponge into an air-cored coil for television channel selectors which comprises, introducing a length of a spongy material into a sleeve so that an end portion of the length is enclosed by the sleeve,

sliding an air-cored coil having an inner diameter substantially equal to the outer diameter of the sleeve onto the sleeve, blocking the air-cored coil in the axial direction and clamping the end portion of the length on both sides of the air-cored coil, withdrawing the sleeve subsequently from the blocked air-cored coil and sliding it over the clamped length so that the



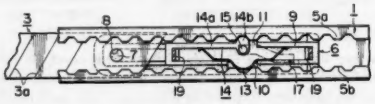
portion of the length enclosed by the sleeve is exposed and engages the inner circumference of the air-cored coil, separating the portion of the length which is enclosed by the air-cored coil from the portion of the length situated in the sleeve, and unblocking the air-cored coil and unclamping the sponge introduced into the air-cored coil so that the air-cored coil with anti-microphony sponge is released.

4,322,885

KNIFE APPARATUS

Hiroshi Osada, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Seki, Japan

Filed Jun. 9, 1980, Ser. No. 157,869
Claims priority, application Japan, Jun. 23, 1979, 54-86188[U]
Int. Cl.³ B26B *1/08*
U.S. Cl. 30—162 **5 Claims**



1. A knife apparatus comprising an elongated handle member having longitudinal edge portions bent in opposite to each other so as to form a groove in said handle, at least one of said longitudinal edge portions being formed with a series of teeth, a slide unit disposed longitudinally slidably within said groove of said handle, a blade slidably disposed in said groove in substantially longitudinal alignment with said slide unit and having a base portion connected to said slide unit, a locking member provided in said slide unit and adapted to be movable between a first position at which said locking member meshes with said tooth train to immobilize said slide unit and said blade and a second position at which said slide unit and hence said blade can be moved longitudinally in said groove, a manipulator member disposed on said slide unit over said locking member movably longitudinally relative to said locking member in a predetermined range, and control means provided in combination with said locking member and said manipulator member to selectively move said locking member to one of said first and second positions in response to corresponding operation of said manipulator member, said locking member being formed integrally with said slide unit and having a flexible arm and a lock portion formed at the free end of said flexible arm and adapted to disengageably mesh with said tooth train, said control means including a cam groove provided at the lower side of said manipulator member, and a cam follower stud formed in said lock portion and adapted to be guided by said cam groove.

4,322,886

TOOL FOR TRIMMING WILLOW TREES

Samuel Marcolongo, 131 Pond St., Stoneham, Mass. 02180

Filed Jun. 19, 1980, Ser. No. 160,949
Int. Cl.³ B26B *3/00*
U.S. Cl. 30—312 **5 Claims**

1. A tool for manually trimming willow trees and adapted for overhead use comprising a generally U-shaped frame having

a base portion and

two arms lying in a common first plane extending from said base portion, the distance between said arms at their midpoints being between 12 and 24 inches, and

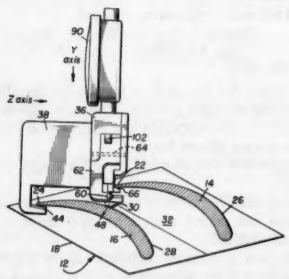
a cutting blade extending between the ends of said arms opposite from said base portion, said cutting blade having a sharpened edge and a planar surface extending therefrom lying in a second plane substantially perpendicular to said first plane, the space between said arms being free from obstructions thereby to enable the tool to be swung over the torso of the user.

4,322,887

METHOD AND APPARATUS FOR OPEN FLOW AREA CLASSIFICATION

Clark R. Burton, Los Altos, Calif., assignor to Compair, Inc., Burlingame, Calif.

Filed Jul. 24, 1980, Ser. No. 171,747
Int. Cl.³ G01B *5/20*
U.S. Cl. 33—174 C **22 Claims**



1. A classification gauge for measuring open flow area of a vane assembly including a leading vane, a following vane and opposite end buttresses, the open flow area being defined by a trailing edge of the leading vane, a convex portion of an airfoil surface of the following vane opposite the trailing edge of the leading vane and inside surfaces of the opposite end buttresses, comprising

a frame,

means arranged on the frame for accurate positioning of the frame on the vane assembly and for locating one lateral end and one longitudinal side of the open flow area,

first probe means for engaging an opposite longitudinal side of the open flow area,

second probe means for engaging an opposite lateral end of the open flow area,

a proportional means arranged for interaction with both the first and second probe means, and

indicator means responsive to the proportional means for providing an indication of open flow area.

4,322,888

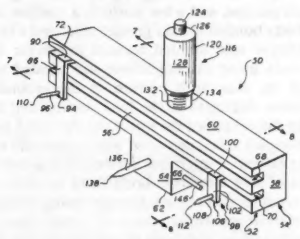
MULTI-PURPOSE GAUGE

Michael Garzione, 28 Barton St., Newburgh, N.Y. 12550

Filed Mar. 10, 1980, Ser. No. 129,177

Int. Cl.³ G01B *5/08*

U.S. Cl. 33—178 D **14 Claims**



1. A gauge comprising:

(a) a housing;

(b) first and second spaced probes secured to and movable with respect to said housing; said probes having free ends terminating in a plane;

(c) a third probe secured to and movable with respect to said housing and intermediate to said first and second probes;

(d) means secured to said housing for simultaneously positioning said first and second probes with respect to one another, such that said third probe remains equidistant from said first and second probes and said free ends remain in said plane; said simultaneous positioning means comprises means for releasably yielding, such that, upon said first or second probes contacting a resistant surface, said positioning means substantially disengaging from said first and second probes;

(e) means for moving said third probe substantially perpendicularly with reference to said plane; said means for moving said third probe comprises means for releasably yielding, such that, upon said third probe contacting a resistant surface, said means for moving the third probe substantially disengaging from said third probe; and

(f) indicia means for indicating the distance between said first and second probes and the distance of said third probe from said plane.

4,322,889

TESTING APPARATUS FOR INVOLUTE AND HELICAL GEAR TEETH

Erwin Guenter, Widen, Switzerland, assignor to Maag Gear-Wheel & Machine Co. Ltd., Zürich, Switzerland

Filed Sep. 15, 1980, Ser. No. 187,626

Claims priority, application Switzerland, Oct. 1, 1979, 8811/79

Int. Cl.³ G01B *7/28*

U.S. Cl. 33—179.5 R **5 Claims**

1. A testing apparatus for involute and helical gear teeth comprising:

a rotatable chucking device for a test piece which is to be tested;

a feeler device containing a feeler which can be moved along two flanks of the test piece;

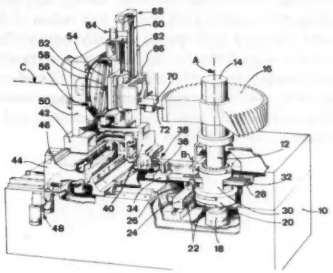
a respective drive means for each said chucking device and said feeler device;

a regulation device for at least one of said drive means;

a mechanical transmission means arranged between said chucking device and said feeler device;

said mechanical transmission means containing transmission elements;

a displacement path transducer arranged between two transmission elements of said transmission means for measuring the relative movement of both of said transmission elements;



an electric circuit for infeeding measuring signals of the displacement path transducer to the regulation device and for superimposing such measuring signals of the displacement path transducer upon measuring signals of the feeler device;

an elastically deformable intermediate element for bridging the displacement path transducer; and

said elastically deformable intermediate element interconnecting both said transmission elements in both of their directions of movement with one another and being structured powerfully enough in order to transmit the greatest moment which can be exerted by said drive means of said feeler device at one of said transmission elements, to the other transmission element.

4,322,890

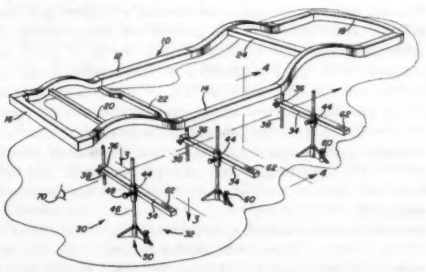
DATUM LINE GAUGE SYSTEM

Davis R. Jarman, 612 Ward Dr., and Virgil H. Hinson, 206 Fairway Oaks Dr., both of Brunswick, Ga. 31520

Filed Mar. 17, 1980, Ser. No. 131,090

Int. Cl.³ G01C *15/12*; G01B *11/26*

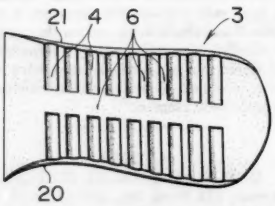
U.S. Cl. 33—288 **6 Claims**



1. A system of gauges for checking and correcting vehicle frame location datum line distances, said system including at

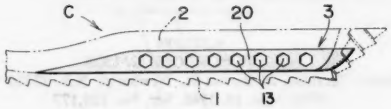
least three gauges, each of said gauges including a horizontal arm, a vertical elongated measuring member guidingly supported from one end of said arm for adjusted vertical shifting relative thereto, first lock means operatively associated with said arm and measuring member for rleasably locking said measuring member in adjusted shifted position relative to said arm, a vertical standard, mounting means mounting said arm from said standard for adjusted shifting therealong and with said arm at right angles relative to said standard, second lock means operatively associated with said arm and standard for releasably locking said arm in adjusted shifted position relative to said standard, level means carried by said arm for indicating when said arm is horizontal, base means carried by the lower end of said standard for support of said standard from a generally horizontal support surface, said base means including means defining a pair of downwardly facing support surfaces spaced along a horizontal path normal to a radius of the center axis of said standard and spaced radially outwardly of said standard and a third downwardly facing and vertically adjustable support surface spaced on the other side of said center axis from said path, said mounting means including means operative to allow at least 180° angular displacement of said standard about its center axis relative to said arm.

4,322,891
SPORT SHOE SOLE
Masanobu Inohara, Akashi, Japan, assignor to Asics Corporation, Kobe, Japan
Division of Ser. No. 896,477, Apr. 14, 1978, Pat. No. 4,236,326. This application Aug. 4, 1980, Ser. No. 174,890
Int. Cl.³ A43B *13/20, 21/28*
U.S. Cl. 36—29 **5 Claims**



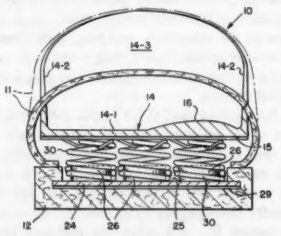
1. A sole for use with sport shoes comprising a rigid abrasion-resistant ground sole, the ground sole having a heel portion, and arch portion, and a toe portion, a resilient and elastic interlayer body bonded to said ground sole, and a resilient and elastic interlayer sole bonded to said interlayer body, said interlayer body being extended over and bonded to the heel portion and the shoe arch portion of the ground sole and having uniform thickness at the heel portion and decreasing into a wedge shape toward the top of the shoe arch portion, the interlayer body being provided with a plurality of parallel, transversely extending grooves on the surface of said interlayer body from its one side to its center while disconnected at said center, the cross section of each groove being semi-circular so as to have uniform distribution of stress, preferred absorbing power of impact load, and a durable shape, the resilience of the interlayer body and the interlayer sole and the air in the grooves permitting preferred absorption of impact load exerted against the heel portion of the sole at the time of landing and good restoration and long durability of arched shapes.

4,322,892
SPORT SHOE SOLE
Masanobu Inohara, Akashi, Japan, assignor to Asics Corporation, Kobe, Japan
Division of Ser. No. 896,477, Apr. 14, 1978, Pat. No. 4,236,326. This application Aug. 4, 1980, Ser. No. 174,892
Claims priority, application Japan, Dec. 28, 1976, 51-177169[U]
Int. Cl.³ A43B *13/20, 21/28*
U.S. Cl. 36—29 **5 Claims**



1. A sole for use with sport shoes comprising a rigid abrasion-resistant ground sole, the ground sole having a heel portion, an arch portion, and a toe portion, a resilient and elastic interlayer body bonded to said ground sole, and a resilient and elastic interlayer sole bonded to said interlayer body, said interlayer body being extended over and bonded to the heel portion and the shoe arch portion of the ground sole and having uniform thickness at the heel portion and decreasing into a wedge shape toward the top of the shoe arch portion, the interlayer bodying being provided with a plurality of parallel, transversely extending apertures between the upper and lower the surfaces of said interlayer body from its each side to its center, the cross section of each aperture being hexagonal so as to have preferred absorbing power of impact load, the resilience of the interlayer body and the interlayer sole and the air in the apertures permitting preferred absorption of impact load exerted against the heel portion of the sole at the time of landing.

4,322,893
INDEPENDENT INSOLE ASSEMBLY
Norrine M. Halvorsen, 169 Sixth St., Rochester, N.Y. 12302
Filed Apr. 3, 1980, Ser. No. 136,893
Int. Cl.³ A43B *13/38, 17/06, 13/18*
U.S. Cl. 36—43 **7 Claims**



1. An insole assembly unit, for embodiment in an article of footwear including a sole and a shoe upper, comprising
a semi-flexible insole attachment member disposed to form at least the foot-supporting portion of the insole of a shoe,
a second, semi-flexible attachment member spaced from said insole attachment member and disposed to be secured to the sole of a shoe,
a plurality of spaced, resiliently compressible elements secured to and extending between said members, and
means for securing said second member to the sole of a shoe whereby said elements support said insole attachment member movably and resiliently above said sole in a finished shoe,
one of said members having thereon spaced multiple clip

means integrally arranged on a surface opposed to the other member, and said other member having thereon spaced, multiple, vertically disposed integral peg means aligned with and opposed to said clip means, and

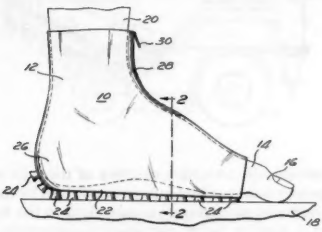
each of said resilient elements being releasably attached at one end to one of said clip means and being sleeved at its opposite end over one of said peg means, whereby said elements are disposed between and interconnect said attachment members.

4,322,894

SURFING FOOTWEAR

William E. Dykes, 23920 DeVille Way, Apt. D, Malibu, Calif. 90265

Filed Apr. 18, 1980, Ser. No. 141,325
Int. Cl.³ A43B *5/08*
U.S. Cl. 36—114 **2 Claims**



1. Novel surfing footwear, said footwear comprising, in combination:

a. a flexible foot covering;

b. surfboard traction-improving means secured to the bottom exterior of said foot covering,

c. wherein said traction-improving means comprises a plurality of suction cups spaced along said bottom, and

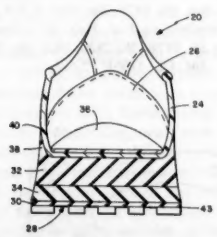
d. wherein said suction cups which are adjacent the front of said foot covering are of decreased depth relative to others of said cups.

4,322,895

STABILIZED ATHLETIC SHOE

Stan Hockerson, 62 Vallejo St., Petaluma, Calif. 94952

Filed Dec. 10, 1979, Ser. No. 101,708
Int. Cl.³ A43B *5/00, 23/08*
U.S. Cl. 36—129 **3 Claims**



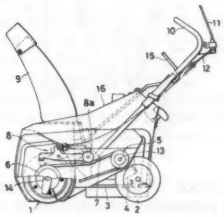
1. An Athletic Shoe comprising a sole having a midsole with a forefoot and heel portions, an upper mounted on the sole, the upper having a counter forming a heel cup having exterior sidewalls, a support band carried on the upper rim of the midsole and secured about the sidewalls of the heel cup, said band extending upwardly and merging with the vertical midspan of the heel cup for supporting and stabilizing the heel cup relative to the sole during contact of the sole onto a surface when in use, the opposite sides of the lower rim of the heel portion having a lateral width greater than the lateral width of the heel cup midspan, and the support band inclines upwardly from the lower rim of the heel portion to the heel cup midspan for resisting flexing of the side of heel cup relative to the sole during initial contact on the surface along one side of the sole.

4,322,896

SNOW BLOWING MACHINE

Takeshi Miyazawa, Wako, and Naotoshi Ono, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1980, Ser. No. 165,681
Claims priority, application Japan, Jul. 7, 1979, 54-86065
Int. Cl.³ E01H *5/00*
U.S. Cl. 37—43 E **4 Claims**



1. In a snow blowing machine of the type including a body, a drive motor mounted on said body, support members for said body, a snow discharge chute mounted on said body, a blower member associated with said chute, an auger having a shaft journalled for rotation on said body, said shaft carrying blade sections of opposite helix for collecting and feeding snow to said blower member, and a drive from said drive motor to said blower member and to said auger, the improvement comprising:

said helical blade sections of the auger being spaced axially of each other on said shaft;

said blower member being mounted on said shaft at a position intermediate said helical blade sections and having blades extending substantially axially of said auger shaft, said blades having edge members on the radially outermost edges of said blower member blades formed from a material having a low coefficient of friction,

a drive from said motor to said auger shaft at a ratio such that said shaft is driven at a speed within the operating range of said blower,

said auger having edge members on the peripheral edges of said helical blades formed from a material having a low coefficient of friction,

said auger being in direct engagement with a ground surface and providing the sole ground engaging support for the front end of said body, and

the residual friction between said edge members and said ground surface providing motive force for moving said snow blowing machine across said ground surface.

4,322,897

AIRLIFT TYPE DREDGING APPARATUS

Robert W. Brassfield, 144 Hayes Ave., Ventura, Calif. 93003

Filed Sep. 19, 1980, Ser. No. 188,685
Int. Cl.³ E02F *3/88*
U.S. Cl. 37—62 **5 Claims**

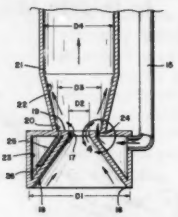
1. A dredging apparatus for raising fluid and debris from the ocean floor, including, in combination:

(a) a generally vertically oriented elongated hollow body having a lower opening of a first given internal diameter decreasing in an upward direction to terminate in a throat opening of a second given internal diameter to define a

venturi entrance, said throat opening immediately increasing in diameter at its exit end to a third given internal diameter to define an upwardly facing horizontal annular step lying in a plane normal to the vertical, said annular step having a plurality of vertical holes passing normally therethrough, the interior wall of said body extending upwardly from said step gradually increasing in internal diameter to an upper opening of a fourth given internal diameter to define a venturi diffuser;

(b) conveying means connected to said upper opening;

(c) means including a gas line and a plenum chamber surrounding the lower portion of said body defining said venturi entrance for introducing a flow of compressed gas



from the exterior of said venturi entrance upwardly through said plurality of vertical holes in said step to said venturi diffuser to draw into said lower opening and venturi entrance, fluid and debris from the ocean floor, said step resulting in cavitation of the flow of said fluid and debris past the exit end of said throat at the step area, to result in a reduced pressure at the step surface to facilitate said flow of gas upwardly through said holes in said step, said fluid and debris passing up said conveying means and

(d) at least one pipe section connected to one of said openings and extending downwardly into said plenum chamber to terminate short of the bottom of said chamber, for enabling removal of any liquid trapped in said plenum chamber.

4,322,898

CUTTER HEAD WITH ADJUSTABLE SUCTION NOZZLE

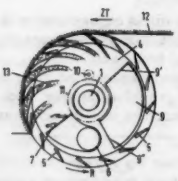
Wouter A. Bos, Av Dordrecht, Netherlands, assignor to Reba B.V., Wolwevershaven, Netherlands

Continuation-in-part of Ser. No. 37,520, May 11, 1978, abandoned. This application May 22, 1980, Ser. No. 152,412

Claims priority, application Netherlands, May 11, 1978, 7805116

Int. Cl.³ E02F *3/92*

U.S. Cl. 37—64 **4 Claims**



2. Rotary cutter head for a cutter dredger, said cutter head being provided with means for suspending said cutter head on a ladder arm of the dredger, means for connecting the cutter head to a control cylinder means for tilting movements of the cutter head and means for connecting a mixture-suction conduit, the cutter head being further provided with a rotatable ring of blades extending substantially in a cylindrical surface coaxial to the cutter head axis and a suction mouth which communicates with said suction conduit as well as a bottom plate at the lower end of the ring of blades, which bottom plate is rotatable for transferring soil loosened by said blades to the suction mouth, said suction mouth being positioned within the ring of blades with the entrance of the suction mouth substantially in a radial plane.

4,322,899

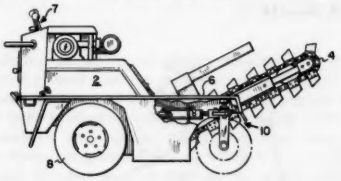
SELF-PROPELLED, NON-RIDING TRENCHING MACHINE WITH A STEERING MECHANISM

Charles A. Clune, Minster, Ohio, assignor to Midmark Corporation, New Bremen, Ohio

Filed May 9, 1980, Ser. No. 148,301

Int. Cl.³ E02F *5/06*

U.S. Cl. 37—86 **13 Claims**



1. In a nonridable, trenching machine of the type having a chassis, a power source, a hydraulic pump driven by the power source, a reservoir supplying hydraulic fluid to the hydraulic pump, and a digging boom cantilevered outwardly from a front portion of the chassis; the improvement comprising:

front fender means extending outwardly from the front portion and being adjacent and parallel to the digging boom;

a front wheel assembly journaled into the fender means;

a double acting cylinder extending between the chassis and the front wheel assembly; and

manually operable valve means located on a rearmost portion of the chassis and communicating with the hydraulic pump and the cylinder such that hydraulic fluid is directed from the pump to the cylinder to selectively rotate the front wheel assembly.

4,322,900

IRONING DEVICE FOR INDUSTRIAL USE AND ASSOCIATED IRON

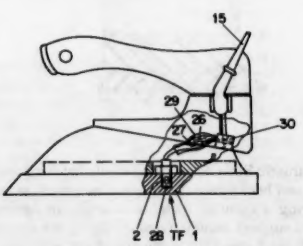
Kurt Hacker, Birkenwaldstrasse 155, 7000 Stuttgart, and Jiri Dokoupil, Hochstrasse 9, 6251 Gückingen, both of Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,314

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1978, 2801012; May 26, 1978, 2822930; May 26, 1978, 2822930

Int. Cl.³ D06F *75/02*

U.S. Cl. 38—77.6 **24 Claims**



1. An ironing device comprising an iron having an electrically heated and temperature regulated sole, at least one tem-

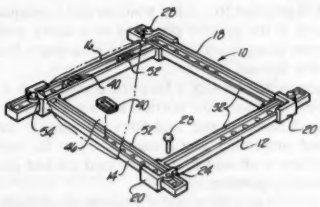
perature sensor positioned in the vicinity of said sole, and a heater connected to an external supply of electrical current, temperature regulating means positioned remote from said iron for controlling the current supply to said heater and responsive to said temperature sensor, said temperature sensor having at least one temperature-dependent resistor, at least one compensating resistor connected with said temperature-dependent resistor, an actual-value input means for setting the desired temperature of said sole, said input means having a component whose resistance is variable to select the desired sole temperature, said temperature-dependent resistor further being connected to said actual-value input means, the overall value of resistance formed by said temperature-dependent resistor and said compensating resistor at a predetermined sole temperature being selected to correspond with the overall resistance of said actual-value input means when the resistance of said variable resistance component has been selected to correspond to said predetermined temperature.

4,322,901

NEEDLEWORK FRAME

Arthur Spitzke, Oxford, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Filed May 27, 1980, Ser. No. 153,434
Int. Cl.³ D06C *3/08*
U.S. Cl. 38—102.6 **7 Claims**



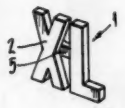
1. An adjustable frame assembly for releasably clamping four sides of a piece of fabric material, comprising; four frame members, each frame member including a head and an elongated body member extending from the head, the head of each frame member having an opening slidably receiving the body member of another frame member in transversely extending relationship thereto to form frame corner portions, fastening means detachably cooperating with each head opposite the associated body member and a slidably received frame member to hold adjacent frame members in selected position relative to each other to define four sides of the frame assembly, each body member having spaced apart walls forming a channel shaped groove therebetween and the top surfaces of said walls defining inner and outer borders, respectively of said frame assembly, a plurality of clamping elements each having opposed portions interfering with said spaced apart walls whereby fabric material disposed in said grooves is clamped in said grooves by said clamped elements, said head having portions aligned and engagable with the outer borders of adjacent body members and engaging top surfaces thereof and leaving the remainder of the head open to expose said grooves in said body member outwardly of the inner border of each of said frame members to receive said clamping elements.

4,322,902

INDICATORS FOR GARMENT HANGERS

Frank C. Lenthall, Frankston, Australia, assignor to F. L. Plastics Industries Pty. Ltd., Victoria, Australia

Filed Apr. 16, 1979, Ser. No. 30,527
Int. Cl.³ G09F *3/00*
U.S. Cl. 40—322 **16 Claims**



1. In combination, a hanger for garments and other articles comprising:

a hook adapted to engage a rail or other supporting means, said hook having an enlarged display portion extending from the hook such that it projects above the top contour of the hook; and

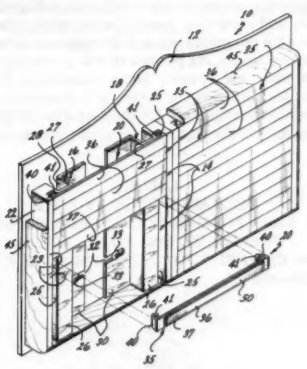
an indicating device attached to said display portion, said indicating device being readily visible when the hanger is in use by virtue of its position on said hook.

4,322,903

DIRECTORY ASSEMBLY

Kenneth E. Beckley, 13460 Highway 8, Bus. Space 120, Lakeside, Calif. 92040

Filed Mar. 30, 1981, Ser. No. 248,818
Int. Cl.³ G09F *11/00*
U.S. Cl. 40—489 **6 Claims**



1. A directory assembly comprising:

at least one module having a left-side major frame member, a right-side major frame member, and a plurality of tab members;

said left-side major frame member having a longitudinal axis and a longitudinally extending channel in its top surface, said left-side major frame member having a tab member support surface located laterally adjacent said longitudinally extending channel;

said right-side major frame mamber having a longitudinal axis and a longitudinally extending channel in its top surface, said right-side major frame member having a tab member support surface located laterally adjacent said longitudinally extending channel; and

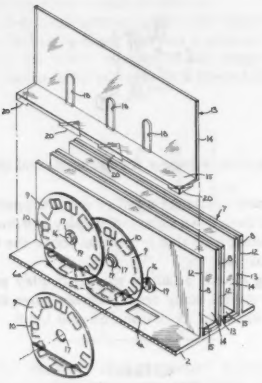
each of said tab members having an elongated body with downwardly extending resiliently compressible means on its opposite ends that are mateable with said longitudinally extending channels on said left-side and right-side major frame members.

4,322,904

INDICIA DISPLAY DEVICE

Kenneth J. Muderlak, Shorewood, Wis., assignor to KCS Industries, Inc., Milwaukee, Wis.

Filed Dec. 21, 1979, Ser. No. 106,002
Int. Cl.[3] G09F *11/04;* G09D *3/08*
U.S. Cl. 40—495 25 Claims



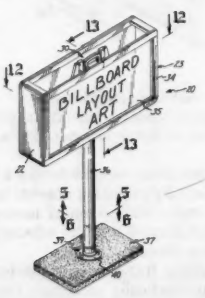
1. An indicia bearing device, comprising an enclosure having a wall with a viewing opening, a narrow non-planar guideway disposed behind the wall, said guideway having a portion aligned with said viewing opening, a sheet of transparent flexible material disposed within the guideway and conforming to the non-planar contour of said guideway, indicia disposed on said sheet, and mounting means for mounting the sheet for rotation within the guideway, and illuminating means disposed within said enclosure, the portion of said guideway disposed in alignment with said opening being translucent whereby the light from said illuminating means will illuminate the indicia exposed within the opening, the sheet adapted to be rotated to expose the indicia through said viewing opening to a viewer.

4,322,905

PORTABLE DISPLAY UNIT

Robert A. Kruse, 11108 Abbott La., Minnetonka, Minn. 55343

Filed Feb. 27, 1980, Ser. No. 125,224
Int. Cl.[3] G09F *15/00, 7/02;* A47B *95/02, 97/04*
U.S. Cl. 40—606 55 Claims



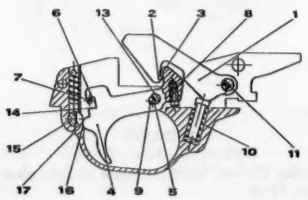
1. A portable display unit convertible between a portable collapsed configuration and a display configuration for exhibition of at least one display card, comprising: a housing having a first display opening for exhibition of a display card located in the housing when said unit is in the display configuration, said housing having a first removable top wall for access into the interior thereof; said top wall having a handle grip opening; retractable handle means assembled in the housing and having a handle grip extendable out of the handle grip opening in the top wall for carrying the unit in the collapsed configuration; a second removable wall for covering said display opening when said unit is in the collapsed configuration; means to releasably secure the second wall in covering relationship to said opening when the unit is in the collapsed configuration; and a stand releasably secured to the housing to support the housing when the unit is in the display configuration.

4,322,906

TRIGGER MECHANISM FOR AUTOMATIC AND SEMIAUTOMATIC FIREARMS OF ANY TYPE

Bruno Civolani, Bologna, Italy, assignor to Benelli Armi S.p.A, Urbino, Italy

Filed Aug. 3, 1979, Ser. No. 63,180
Claims priority, application Italy, Oct. 27, 1978, 44022 A/78
Int. Cl.[3] F41C *17/02*
U.S. Cl. 42—70 E 4 Claims



1. A trigger mechanism for a firearm comprising
an elongated hammer pivotally mounted at one end thereof on said firearm to be rotated in one direction from a cocked position to a firing position and subsequently to be rotated in the reverse direction to a safety position, said hammer at an intermediate portion having a first projecting dog formed thereon;
a trigger means having a forward portion and a rearward portion, said forward portion having a pivotal mounting on said firearm, and said forward portion including a second projecting dog formed thereon for selective engagement with said first dog in said cocked position and said safety position;
said rearward section of said trigger means including a notch having upper and lower edges engageable with a stop pin mounted on said firearm to provide limited rotation of said trigger means, said upper edge being in contact with said stop pin when said hammer and trigger means are in said cocked position, and said lower edge being in contact with said stop pin when said hammer and trigger means are in said firing position and said safety position.

4,322,907

SELF-CLOSING PROPELLANT CHARGE PACKAGE

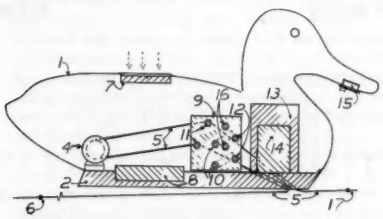
John P. Rowe, Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 3, 1980, Ser. No. 126,734
Int. Cl.[3] F42B *39/00*
U.S. Cl. 42—88 4 Claims

1. In the combination of a loading device for a powder-actuated tool, a projecting tubular loading port insert adapted

for passage of charges therethrough and a self-closing propellant charge package, wherein said loading port insert cooperates with said loading device for the passage of charges thereinto, said charge package comprising a substantially tubular body of a size to receive a plurality of charges in serial alignment, said body having one end at least partially closed to prevent passage of charges therethrough and one end open; the improvement comprising: a plurality of deformable, charge-retaining nodes, integrally formed in a portion of said body proximate said open end, said nodes being adapted for reformation between a first, undeformed, condition, wherein passage of charges through said body portion is prevented, and a second, deformed, condition admitting of ready passage of charges through said body portion, said body being adapted for telescoping emplacement on said loading port insert whereby said nodes are displaced to assume said second condition, allowing charges in said body to pass freely through said loading port insert, into said loading device, said nodes each being defined by a pair of intersecting planes, one of said planes being inclined approximately 15° relative to the longitudinal axis of said body, the other of said planes being inclined approximately 4° relative to said axis.

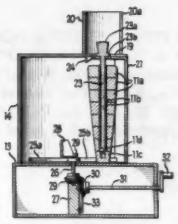
4,322,908
ANIMATED WILDFOWL DECOY
Roy E. McCrory, 4044 Bishops Bridge Rd., Memphis, Tenn. 38118
Filed Feb. 29, 1980, Ser. No. 125,927
Int. Cl.³ A01M *31/06*
U.S. Cl. 43—3 **10 Claims**



1. An animated wildfowl decoy comprising a floatable hollow body having a bottom with an opening therein; the hollow body being formed in the image of a wildfowl and housing therein a fixed capstan means; a length of tether line means with an intermediate portion thereof looped through the bottom opening and entrained about the capstan means, the end portions of the tether line means being adapted to be tautly secured; and an electric circuit including a battery and a motor attached to the capstan means for rotating the capstan means to pull the hollow body along the length of said tether line means.

4,322,909
TOY FOOD PROCESSOR
Edward T. Holahan, Chicago, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Oct. 20, 1980, Ser. No. 199,006
Int. Cl.³ A63H *3/52*
U.S. Cl. 46—14 **12 Claims**

5. A toy food processor, comprising a housing having an opening in one side wall thereof, a door movable from an open position to a closed position to close said opening, a separable food slice module comprising a plurality of simulated slices of food product and holding means for releasably holding said slices in stacked relationship in a substantially vertical position, means for detachably supporting said module on said door, release means responsive to closing movement of said door for releasing said slices for gravity pull removal from said holding

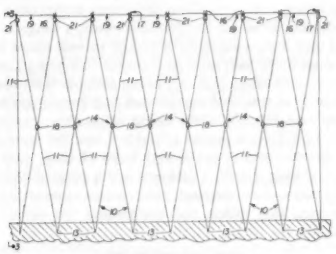


means, and dispensing means for expelling the released slices from the toy.

4,322,910
CRYOGENIC DEFOLIATION
Paul W. Garbo, 48 Lester Ave., Freeport, N.Y. 11520
Filed Nov. 16, 1979, Ser. No. 94,945
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—1.7 **1 Claim**

1. A process for defoliating cotton plants which comprises spraying said plants with liquefied carbon dioxide gas to reduce the temperature sufficiently to cause fatal injury to the leaves of said plants.

4,322,911
VINE SUPPORT FOR PLANTS
William D. Bach, 2141 Yancy Ave., Montgomery, Ala. 36107
Filed Aug. 1, 1980, Ser. No. 174,685
Int. Cl.³ A01G *17/06*
U.S. Cl. 47—45 **2 Claims**



1. A vine support for plants comprising:
(a) a plurality of pairs of upstanding wire-like members with the lower ends of the wire-like members of each pair being connected to each other and adapted to be anchored in the ground in spaced relation to each other with adjacent wire-like members of adjacent pairs extending upwardly across each other and terminating in spaced apart upper end portions,
(b) a sleeve-like element telescoping over the crossed portions of adjacent wire-like members of adjacent pairs restraining relative movement of said crossed portions,
(c) each of said upper end portions extending alongside the upper end portion of the next adjacent wire-like member of the next adjacent pair of wire-like members to define pairs of spaced apart upper end portions,
(d) a sleeve-like member telescoping over each said pair of upper end portions, and
(e) an elongated wire-like connector member extending between adjacent pairs of said upper end portions and having loop-like end portions which telescope over and

detachably connect said adjacent pairs of upper end portions.

4,322,912

SAFETY DEVICE FOR A VEHICLE DOOR ACTUATED BY A TURNABLE SHAFT

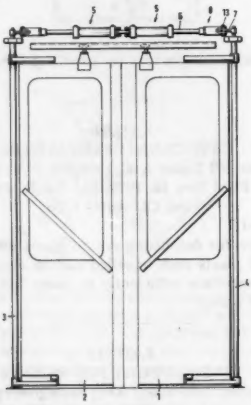
Siegfried Heinrich, Edermunde, Fed. Rep. of Germany, assignor to Gebr. Bode & Co., Kassel, Fed. Rep. of Germany

Filed Feb. 29, 1980, Ser. No. 125,757

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928315

Int. Cl.³ E05F *15/02*

U.S. Cl. 49—28 **10 Claims**



1. A safety drive apparatus for a vehicle door of the type actuated by a turnable shaft driven by a piston-cylinder unit having a piston rod, said drive apparatus comprising a lever arm fixedly mounted on the turnable shaft, a hinge bolt connected to said arm, a carrier connected to said hinge bolt and coupled thereby to said arm, said piston rod being connected with play to said hinge bolt and being slidable with respect to said carrier to enable said carrier and said piston rod to move relative to one another while being separately connected to said hinge bolt, switch means actuable when the door encounters an obstacle and is prevented from closing, said switch means comprising a switch element and a control element for operating said switch element, said carrier supporting one of said elements, said piston rod supporting the other of said elements.

4,322,913

AUTOMATIC DOOR FOR PETS

Robert D. Himmer, 500 N. Byfield, Westland, Mich. 48185

Filed May 8, 1980, Ser. No. 147,836

Int. Cl.³ E06B *7/28*

U.S. Cl. 49—168 **5 Claims**

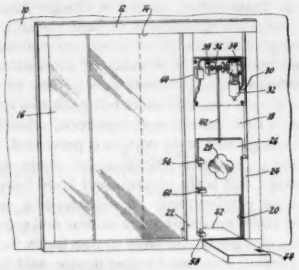
1. In a building having an opening, the combination comprising:

a first, larger door and a second, smaller door, collectively blocking said opening, and means supporting the larger door for motion toward a position in which it unblocks at least a part of said opening;

means mounting the smaller door for vertical sliding motion between a first position in which it unblocks a portion of said opening and a second position in which the smaller door blocks said portion of the opening;

power means connected to the smaller door so as to be operable to move the smaller door from said second position to said first position; and

a first floor-mounted pressure pad on a first side of said opening, and a second floor-mounted pressure pad on the opposite side of said opening, and means electrically connecting said pressure pads to said power means whereby



each of said pressure pads is operative to energize said power means to move said smaller door from said second position to said first position.

4,322,914

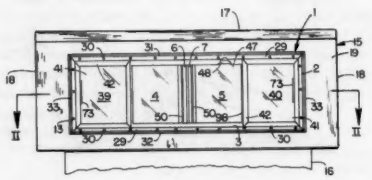
SLIDEABLE CLOSURE CONSTRUCTION

Donald C. McGaughey, Bristol, Ind., assignor to State Wide Aluminum of Indiana, Inc., Elkhart, Ind.

Filed Nov. 20, 1979, Ser. No. 96,192

Int. Cl.³ E06B *3/42*; E05D *13/04*; E06B *7/16*

U.S. Cl. 49—370 **13 Claims**



1. A slideable closure construction comprising:

a frame having a slide track therein;

first and second closures slideably mounted in said track and including interior end edges which abut in a closed position and are spaced apart in an open position;

a male latch member connected with one of said closure end edges and extending along the length thereof;

a female latch member connected with the other of said closure end edges and extending along the length thereof; said female latch member being shaped to selectively receive said male latch member therein and form a snap lock which securely interconnects said first and second closures in the closed position and simultaneously forms a weatherproof seal therebetween;

said male latch member comprising a bead having a plug portion with a bulbous transverse cross-sectional shape;

said female latch member comprising a channel including a pair of flanges spaced apart a distance adapted to receive said plug portion therebetween in an interference fit;

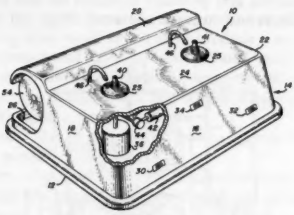
said female latch member including a base portion mounted in a first rigid frame with said flanges protruding therefrom; and

said female latch base portion being loosely mounted in said first frame in a manner which permits said female latch member to float in said first frame for smooth and reliable engagement with said male latch member.

4,322,915
APPARATUS FOR BEVELING GLASS

Morris L. Kindig, 255 S. Rengstorff, Mountain View, Calif. 94040

Filed May 12, 1980, Ser. No. 149,029
Int. Cl.³ B24B 9/10
U.S. Cl. 51—3 17 Claims



1. An apparatus for beveling glass or glass-like material comprising, in combination:

a flat rigid surface member supported above and parallel to the plane of the surface upon which the apparatus is situated for receiving and supporting a piece of material to be beveled, the flat rigid surface member having at least one aperture extending therethrough;

a beveling spindle projecting upward through each said aperture with its axis of rotation perpendicular to the plane of the flat surface member, the beveling spindle comprising an integrally formed member symmetrical about a vertical axis of rotation and including a flywheel ring section, a beveling cone section adjacent to said flywheel ring section, an edging ring section adjacent to said beveling ring section, a gripping ring section adjacent to said edging ring section and a stem section adjacent to said gripping ring section, the surfaces of said beveling cone section and said edging ring section being abrasive and together forming a grinding surface;

means for adjusting the relative height of each spindle with respect to the top of the flat surface; and

means for causing each beveling spindle to rapidly rotate about its axis of rotation whereby as a piece of material is urged over the flat rigid member towards the axis of the spindle, the edge of the material intersects said grinding surface and is ground.

4,322,916
APPARATUS FOR MAKING MULTIPLE RIB BELTS

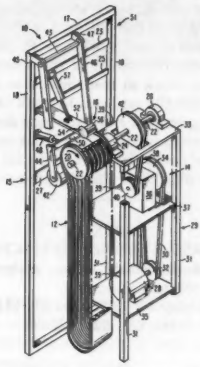
Kenneth D. Richmond, Nixa, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 886,206, Mar. 13, 1978, abandoned. This application Jul. 12, 1979, Ser. No. 56,756
Int. Cl.³ B24B 7/02
U.S. Cl. 51—78 10 Claims

1. An apparatus for separating a multiple rib endless power transmission belt made primarily of elastomeric material and having at least two pulley engaging ribs into smaller multiples of at least one pulley engaging rib, said apparatus comprising:

(a) a support frame;

(b) a belt holding and rotating assembly comprising, a multiple groove sheave rotatably mounted on said frame and being adapted to support said belt thereon so that a lower portion of said belt hangs free, said sheave having a plurality of alternating grooves and ribs therein with each of said grooves having a cross section which conforms to the cross section of each of said ribs of said belt being separated, means for rotating said sheave at a predetermined rotational speed, and a roller for contacting the outer surface of said belt and forcing said pulley engaging ribs into contact with an upstream portion of said sheave during rotation thereof to thereby assure positive alignment of said belt ribs with said sheave grooves; and,

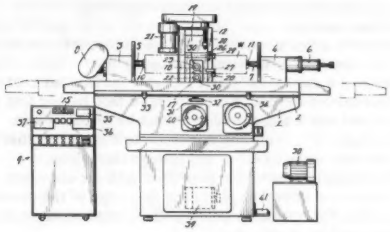


(c) a cutting assembly mounted on said frame, said cutting assembly comprising cutting means for engaging said belt and cutting same completely therethrough between two of said pulley engaging ribs.

4,322,917
DOUBLE-HEAD AUTOMATIC GRINDING MACHINE

Minoru Ueda, Yamato, Japan, assignor to Ueda Giken Co., Ltd., Yamato, Japan

Filed Mar. 27, 1980, Ser. No. 134,466
Claims priority, application Japan, Apr. 5, 1979, 54-41504
Int. Cl.³ B24B 5/04
U.S. Cl. 51—123 R 2 Claims



1. In a double-head automatic grinding machine comprising: a stationary support base; a motor driven table supported on said support base for movement in the longitudinal direction of the support base; a main shaft support block mounted on said table and supporting a motor driven main shaft; a tail stock mounted on said table in opposition to said main shaft support block and supporting a work center abutment rod so as to pinch a workpiece between the main shaft and said rod; a motor driven grinding wheel support block mounted on said stationary support base for movement in a direction normal to the movement direction of said table; and cup-shaped coarser and finer grinding wheels mounted on said grinding wheel support block so that movement of said block displaces said cup-shaped coarser and finer grinding wheels at right angles to the center axis of the workpiece, whereby said workpiece rotating at a low speed is moved in the longitudinal direction of said support base as said table is moved in the same longitudinal direction by a motor, the improvement comprising said grinding wheel support block includes a threaded lifting block slidably received in the grinding wheel support block, two grinding wheel shafts rotatably mounted in said lifting block in vertically spaced relationship, means for finely adjusting said

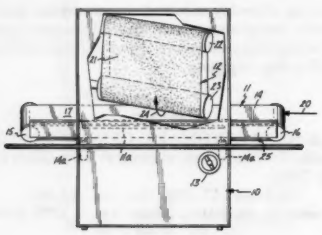
grinding wheels with respect to said workpiece, a control board, and a linear scale secured to one side of said grinding wheel support block and operatively connected to said control board, each of said cup-shaped grinding wheels being mounted on each of said shafts so that the axes of the wheels are offset from the center axis of said workpiece by the distance corresponding to the effective radius of the wheels, and means to operate said lifting block so that the coarse and fine grinding wheels are automatically replaced by each other according to an optional cutting amount and frequency comprising a motor operatively connected to said lifting block and to said control board, said control board employing a digital limiter for selecting minimum and maximum cutting amounts.

4,322,918

ABRASIVE GRINDING MACHINE

Clarence I. Steinback, Edina, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Filed May 23, 1980, Ser. No. 152,799
Int. Cl.³ B24B *21/04*
U.S. Cl. 51—138 **21 Claims**



1. An abrasive grinding machine comprising:
(a) frame means;
(b) endless conveyor belt means carried by the frame means, the conveyor belt means having an upper flight which defines a substantially flat movable surface for carrying workpieces thereon, the movable surface having first and second edges and a predetermined longitudinal axis;
(c) means for driving the conveyor belt means so that the movable surface carries workpieces therealong;
(d) stationary fence means associated with the conveyor belt means and extending along the first edge of the movable surface for retainably guiding transported workpieces;
(e) an endless abrasive belt;
(f) means for mounting the abrasive belt for abrasive movement relative to said movable surface, the mounting means comprising a contact roller rotatably carried by the frame means in parallel, spaced relating to the movable surface, the contact roller having a rotational axis that is disposed at an acute angle relative to the longitudinal axis of the movable surface;
(g) and means for rotatably driving the contact roller so that during its abrasive movement the endless abrasive belt moves in a direction toward the fence means.

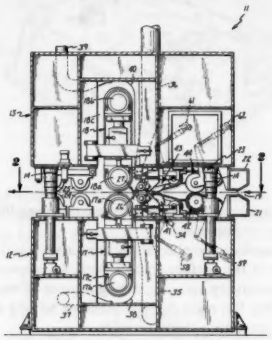
4,322,919

SELF-CENTERING FEED MECHANISM FOR AN ABRASIVE GRINDING MACHINE

Dennis J. Gerber, Minneapolis, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Filed Jun. 27, 1980, Ser. No. 163,781
Int. Cl.³ B24B *21/04*
U.S. Cl. 51—139 **46 Claims**

1. Self-centering feed apparatus for an abrasive grinding machine having upper and lower sanding heads between which a center line extends along which workpieces are moved, the self-centering feed apparatus comprising first and second guide means disposed in opposed relation above and below the center line, each of said guide means comprising:
(a) a plurality of independently operable control arm mechanisms disposed in side-by-side relation;
(b) pivot means for supporting said plurality of control arm mechanisms for independent pivotal movement about a common pivot axis;
(c) each of said control arm mechanisms comprising
(i) a control arm pivotally mounted on said pivot means for movement toward and away from said center line:



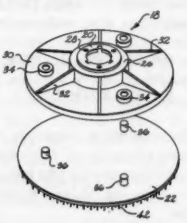
(ii) workpiece drive means mounted on the control arm remote from the pivot means for engagably driving the workpiece along the center line;
(iii) first biasing means for resiliently urging the control arm and workpiece drive means toward the center line under a substantially constant force;
(iv) and second biasing means for resiliently urging the control arm and workpiece drive means toward the center line under a force that increases as a function of the amount of movement of a control arm away from the center line by a workpiece.

4,322,920

ROTARY FLOOR CONDITIONING MACHINE ATTACHMENT

Raymond E. Wells, Rte. 6, P.O. Box 929, Greer, S.C. 29651

Filed Oct. 29, 1979, Ser. No. 89,159
Int. Cl.³ B24D *17/00*; B24B *23/00*; A46B *13/02*
U.S. Cl. 51—168 **1 Claim**



1. An attachment for use on a rotary floor conditioning machine comprising:
a master block integrally molded of a urethane elastomer including;
(i) a centrally located hub;
(ii) a circular flange member extending radially from said hub having a generally planar bottom surface; and
(iii) a plurality of circumferentially spaced vertically extending tubular receivers carried on said circular flange;
a clutch plate secured to said hub;

an attachment plate integrally molded of a urethane elastomer including;

(i) a circular disk having a generally planar top surface mating with said bottom surface of said flange member;

(ii) flexible torque-transmitting posts carried vertically extending on said disk at locations corresponding to the locations of said tubular receivers carried on said master block,

said posts having a diameter corresponding to the diameter of said tubular receivers so as to produce a snug connection between said posts and said tubular receivers when said posts are inserted therein for securing said attachment plate to said master block and transmitting torque while allowing flexing therebetween;

said circular flange member extending outwardly from a lower portion of said hub;

a plurality of circumferentially spaced radially extending stiffening ribs extending between said hub and said circular flange;

said circular disk including two superimposed layers of urethane elastomer material;

engagement means molded into and extending out the lower layer of said two superimposed layers for penetration and securing a scrubbing or polishing pad; and

said upper layer of superimposed layers being less flexible than said lower layer.

4,322,921

ECCENTRIC PLATE GRINDER

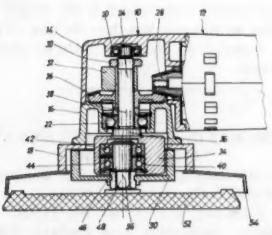
Peter Maier, Gerokstrasse 1, 7311 Neidlingen/Teck, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,771

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938704

Int. Cl.³ B24B *23/00*

U.S. Cl. 5—170 MT **6 Claims**



1. An eccentric plate grinder comprising:

a housing;

a drive shaft rotatably supported in said housing;

a grinding plate to be moved in a cycloidal path;

a male gear ring;

a female gear ring fixed to the grinding plate and driven by said male gear ring, the female gear ring having a greater number of teeth than the male gear ring, said male gear ring being fixed eccentrically to said drive shaft for rotation with said drive shaft and with respect to said housing and grinding plate, said male and female gear rings both being movable with respect to said housing.

4,322,922

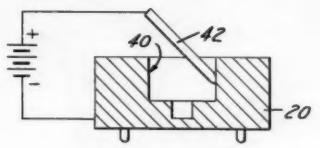
METHOD OF FORMING ELECTRICAL DISCHARGE MACHINE TOOLS

Dennis D. Gilliam, 32721 Lancaster Dr., Warren, Mich. 48093

Filed Apr. 3, 1980, Ser. No. 136,821

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—325 **4 Claims**



1. A method of forming graphite electrodes to be used in an electric discharge machining process which comprises:

(a) forming a master cutting block from a steel block by a mechanical machining process,

(b) coating the surfaces of the steel master, which are to cut a graphite electrode, with a hard material having rough surface characteristics which permit it cut the graphite when carried in an orbiting abrading machine and applied to the graphite,

(c) positioning the coated steel master block in an orbiting abrading machine, and

(d) moving the block into a graphite block to form a shaped graphite electrode.

4,322,923

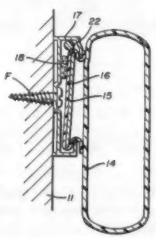
MOUNTING FOR INFLATABLE DOCK SEAL

Larry O'Neal, 4953 Timbercrest Dr., Canfield, Ohio 44406

Filed Nov. 6, 1980, Ser. No. 204,459

Int. Cl.³ E06B *7/22*

U.S. Cl. 52—2 **4 Claims**



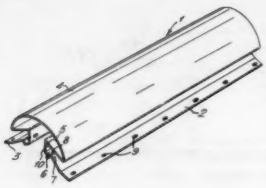
1. An inflatable dock seal and mounting therefor for positioning said dock seal on a wall above and beside a dock opening therein and comprising at least one flexible inflatable member arranged in an inverted U-shape having an upper horizontal section and a pair of spaced vertical sections, flexible channel members formed on the exteriors of said horizontal and vertical sections, elongated structural members of known widths positioned in said flexible channel members, rigid cross sectionally C-shaped channel members having opposed edges with the width of the opening between said opposed edges being less than the known width of said elongated structural members, said elongated structural members and said flexible channel members being movably engaged in said rigid cross sectionally C-shaped channel members, the arrangement requiring said elongated structural members to be moved edgewise when positioned therein.

4,322,924

ROOF RIDGE CAPPING

Christopher A. Cooper, Sittinghurst, England, assignor to Marley Tile AG, Zug, Switzerland

Filed Oct. 13, 1978, Ser. No. 951,300
Int. Cl.³ E04B 7/00
U.S. Cl. 52—57 **11 Claims**



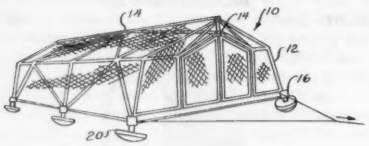
1. A tiled roof having a plurality of overlapping tiles, said tiles having downwardly projecting nibs adjacent their upper edges, and said tiles extending to a ridge on said roof, the ridge being provided with an elongate capping member comprising a pair of longitudinally extending flanges interconnected by a capping section which is connected to at least one of said flanges by a re-entrant portion defining with the said flange a longitudinally extending recess for receiving the upper edges of the roof tiles, the flange having a longitudinally extending abutment facing upwardly into the recess and over which the nibs are engaged, the nibs and the abutment having surfaces in contact so as to retain the tiles in position.

4,322,925

MOBILE STRUCTURE

Alfred J. Geisler, Jr., Rte. #1, P.O. Box 295A, Hampshire, Ill. 60140

Filed Mar. 30, 1978, Ser. No. 891,882
Int. Cl.³ E04B 1/34; E04H 1/12
U.S. Cl. 52—143 **2 Claims**



2. In a mobile structure, a flexible framework assembly comprising:

a. first and second beam members;

b. a first plate extension portion rigidly affixed to the first beam member and in juxtaposition with the second beam member, said first plate extension portion having a plurality of openings therein adapted to receive elongated fastener means;

c. a second plate extension portion extending from the second beam member and affixed thereto, located in spaced relation to said first plate extension portion, and having a plurality of openings therein adapted to receive fastener means and positioned in alignment with cooperating openings in said first plate extension portion;

d. a substantially rectangular block member interposed said plate extensions, having elongated openings extending in a first direction parallel to said beam members defined therein, to allow fasteners to protrude through the aligned openings in said plate extensions and providing a close fit against the fasteners along a first direction while providing a loose fit along a second direction; and

e. fastener means extending through said aligned openings and said block member for securing said members into a joint assembly; and

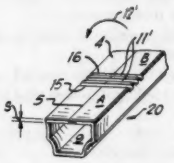
f. means for supporting said structure comprising a plurality of freely rotatable dish members characterized by a broad curved rolling surface arranged to provide terrain contact along selected portions of said curved surfaces.

4,322,926

FRAME FOR SPACING GLASS PANES

Hermann Wölflingseder, and Werner Wölflingseder, both of Feldkirch, Austria, assignors to Seraphin Pumpell & Söhne KG, Feldkirch, Austria

Filed Dec. 17, 1979, Ser. No. 104,690
Int. Cl.³ E06B 7/12
U.S. Cl. 52—172 **5 Claims**



1. A spacing frame for use in forming an insulated arrangement of spaced glass panes so that the frame in combination with the glass panes forms a closed space, comprising a continuous length of a tubular bar having a continuous hollow interior region containing a granular hygroscopic material, said tubular bar including a first wall section forming the inside border of said frame and defining the edges of the closed space, said first wall section having a passage extending in the length direction of said tubular bar for communicating between the closed space and the hollow interior region containing the hygroscopic material, a second wall section forming an outside border of said frame and a pair of side walls extending between said first and second wall sections, said side walls extending substantially integrally at the corners of said frame and forming frame corner sides which are substantially smooth, the inner surfaces of said first wall section, second wall section and side walls forming the hollow interior region, said tubular bar being bent to form said corners, the corners of the spacing frame each comprise a plurality of narrow cuts with opposite parallel surfaces formed in said first wall section and formed between said cuts, said cuts having a depth approximately equal to the thickness of said first wall section so that said cuts open into the hollow interior region and a width in the length direction of said tubular bar equal to or less than the size of the granular hygroscopic material so that the material does not flow through said cuts.

4,322,927

METHOD OF MAKING STAIRCASES AND STAIRCASE MADE THEREBY

Kenneth E. Scott, Rangiora, New Zealand, assignor to Kenscot Industries Limited, Canterbury, New Zealand

Filed Sep. 4, 1979, Ser. No. 71,924
Claims priority, application New Zealand, Sep. 25, 1978, 188525
Int. Cl.³ E04F 11/00
U.S. Cl. 52—188 **15 Claims**

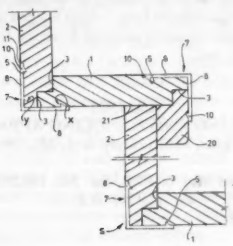
1. A method of making a step for a closed-tread staircase comprising the steps of:

providing a slab for the tread and a slab for the riser, each slab having formed thereon:

a first rebate across the width of one face of the slab, along one edge of said slab; a second rebate across the width of the other face of the slab, along the opposite edge of said slab; a first groove parallel to and adjacent said one edge on said other face of the slab; and a second groove parallel to and adjacent said opposite edge on said one face of the slab;

forming a step comprising a tread and riser pair, said pair being formed by mating one of the rebates on one slab with one of the rebates on the other slab to form a joint, said rebates being shaped and dimensioned such that the mated rebates fit closely to form a joint of predetermined angle;

providing a joining strip which is V-shaped in cross section and has two sides, each formed with a flange adjacent the outer free end thereof protruding from the inside face of each side and the angle between said flange surface facing



the inside corner of the V and the plane of said corresponding side being equal to or less than 90°;

and securing said joint with said joining strip by engaging the flange on one side of the joining strip with the groove adjacent one side of the joint and forcing the flange on the other side of the joining strip into engagement with the groove adjacent the other side of the joint; the angle between the two sides of the joining strip when said strip is engaged with the joint being equal to the angle of the joint.

4,322,928

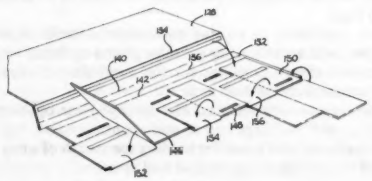
ASPHALT COMPOSITION SHINGLES

Bennie Freiborg, 4536 Indiana Ave., La Canada, Calif. 91011

Filed Mar. 31, 1980, Ser. No. 135,466

Int. Cl.³ E04D *1/20*

U.S. Cl. 52—521 **18 Claims**



1. A shingle comprising a unitary sheet of asphalt composition roofing material characterized by a substrate of asphalt saturated felt and a layer of granules on the top surface thereof bonded to the saturated felt by a layer of asphalt, said unitary sheet having an upper region, an intermediate region and a lower region, a first portion of said lower region being folded upward about a first fold line between said intermediate region and said lower region to lie flat against the top surface of said intermediate region, the remaining portion of said lower region being folded about at least one fold line approximately perpendicular to said first fold line to overlie, top surface up, said first portion of said lower region which in turn overlies a portion of said intermediate region.

4,322,929

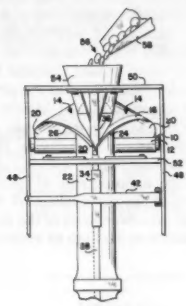
PACKAGING METHOD USING AN ADHESIVE COATED WEB

Robert G. Neumann, Dayton, Ohio, assignor to The Specialty Papers Company, Dayton, Ohio

Filed Mar. 12, 1980, Ser. No. 129,764

Int. Cl.³ B65B *9/08*

U.S. Cl. 53—451 **2 Claims**



1. In a method of continuously forming and filling packages of the type wherein an advancing web having opposing longitudinal edges is shaped into a tube in which the longitudinal edges overlap to form a longitudinal seam, the longitudinal seam is passed in between a shoe located externally of the tube and a tongue positioned internally of the tube proximate the longitudinal seam, and the longitudinal seam is sealed by heating the shoe and urging the shoe toward the tongue, a portion of the tube is compressed and heated by a pair of opposing dies whereby the tube is laterally sealed, and portions of the tube are filled with a product between the lateral seals, the improvement comprising:

utilizing a web having a side of the web coated with a hot melt coating compound such that a longitudinal strip adjacent a longitudinal edge remains uncoated whereby the longitudinal strip forms an inner inside-facing overlapped edge of the seam and abuts the tongue as the seam is laterally sealed so that the tongue remains free from accumulations of hot melt coating.

4,322,930

METHOD FOR FILLING AND ASSEMBLING EXTENDED DISPENSING DEVICE

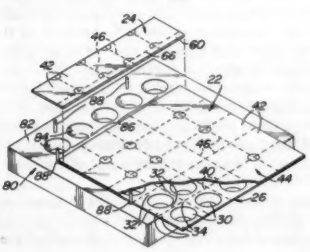
Milton Braverman, 640 Wynmill Pl., Philadelphia, Pa. 19115

Filed Feb. 14, 1980, Ser. No. 121,354

The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.

Int. Cl.³ B65B *7/28, 67/00*

U.S. Cl. 53—471 **5 Claims**



1. A method of assembling a multi-compartment medicinal dispensing device and a multi-compartment extender therefor

utilizing a fixture having a first predetermined number of openings therein arranged in an array of plural rows, said device comprising a base in the form of a plurality of article-holding units each having flanges detachably connected along predetermined weakened lines and a chamber depending from each flange, said units being arranged in a second predetermined number of rows of plural units and a cover sheet secured over the chambers and including weakened lines corresponding to the weakened flange lines to enable each unit to be separated from the others, said extender comprising at least one row of a third predetermined number of article-holding units and a cover sheet, said extender being constructed like said device and wherein the cover sheet of said extender includes a transversely extending tab for securement to the cover sheet of said device, said method comprising: (a) locating an assembled device in said fixture to leave exposed in said fixture a row of openings immediately adjacent said device, (b) disposing the base of said extender on said fixture with the chambers thereof being located within the exposed row of openings in said fixture, and with the tab of the cover sheet of the extender disposed over an edge of the cover sheet of the assembled device, and (c) applying pressure to said tab to secure it to the cover sheet of the device.

4,322,931

METHOD OF MANUFACTURING PACKS OF CIGARETTES AND PACK PRODUCED BY SUCH METHOD

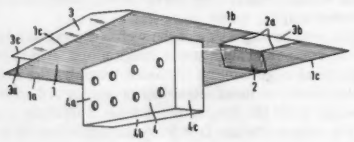
Otto Niepmann, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Fr. Niepmann & Co., Gevelsberg, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,310

Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919265

Int. Cl.³ B65B *11/58*

U.S. Cl. 53—449 **7 Claims**



1. A method of manufacturing a cigarette package from a foil wrapping which surrounds a block of cigarettes on all sides and from a printed paper wrapper, which leaves one end of the foil-wrapped block of cigarettes free and which is closed by a bottom fold at its other end, comprising the steps of

cutting at least one tab on a foil blank by two incisions in the region of the bottom fold to be subsequently produced,

bending the tab off approximately at right angles to the foil blank,

bringing the foil blank and a wrapper blank of substantially the same size together and connecting said blanks to each other in a manner such that corresponding edges of the two blanks coincide approximately on three of the corresponding edges and that said foil blank projects beyond said wrapper blank on a fourth edge,

feeding said connected blanks to a parallelpiped-shaped folding mandrel with the foil blank against the mandrel and in a position projecting beyond the long or wide sides of the folding mandrel and positioning the bent tab of the foil blank so as to cover at least a part of a smaller, bottom side of the folding mandrel,

folding the connected blanks around the long and wide sides of the folding mandrel so as to form long overlapping portions on at least one long or wide side of the folding mandrel,

gluing the overlapping portions at the at least one long or wide side,

at said other end folding narrow flaps (which constitute portions of both said foil blank and said wrapper blank which project beyond the long sides of the mandrel) in a direction toward the bottom side of the mandrel and then,

folding a first wide flap, which projects beyond a wide side of the mandrel opposite to an exposed projecting portion of the wrapper blank from which the tab has been bent-off, in a direction toward said tab, and then

folding a bottom flap which includes said exposed projecting portion of the wrapper blank against the last mentioned flap, said tab thereby lying on the bottom side of the folding mandrel, thereby producing the bottom fold and the cigarette package which is open at said one end,

withdrawing the cigarette package from the folding mandrel via said one end.

4,322,932

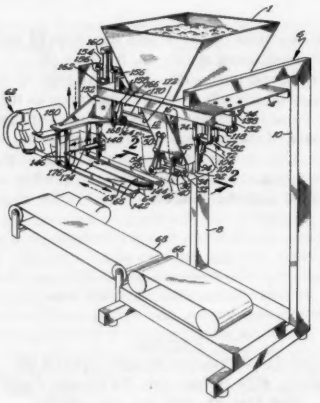
BAG FILLING AND HANDLING APPARATUS

Harold R. McGregor, 1444 Lincoln Ave., SE., Owatonna, Minn. 55060

Filed May 5, 1980, Ser. No. 146,303

Int. Cl.³ B65B *3/06*

U.S. Cl. 53—505 **14 Claims**



1. Apparatus for filling and handling bags comprising:

hopper means containing particulate material to be dispensed into bags;

a spout positioned to receive particulate material from said hopper, said spout having a discharge end operable between open and closed positions for the controlled discharge of particulate material into bags;

first power means positioned and arranged for opening and closing said discharge end of said spout;

clamp means on said spout for holding the mouth of a bag to be filled on said discharge end of said spout;

second power means operatively connected to said clamp means for moving said clamp means between bag clamping and bag release positions;

a pair of vertically oriented arm assemblies positioned on opposite sides of said spout at locations where they will extend inside of a bag mouth when a bag is clamped on said discharge end of said spout, said arm assemblies being laterally shiftable towards and away from each other in a direction generally perpendicular to the clamping path of movement of said clamp means to selectively engage and hold the opposed, upright sides of a bag in predetermined positions in coordination with the opening and closing of said clamp means for optimum distension and forming of a bag mouth during filling; and

third power means connected to said arm assemblies and operable to laterally shift said arm assemblies;

conveyor means positioned below said hopper means for the movement of filled bags to a bag closing station;

a pair of bag gripping and forming bars movably supported on guide means for up and down movement and for back and forth traversing movement in a direction generally parallel to said conveyor means between a rest position laterally displaced from said spout and a position under said spout in embracing juxtaposition to the top end of a bag being filled, said forming bars being further movable towards and away from each other for bag gripping and release;

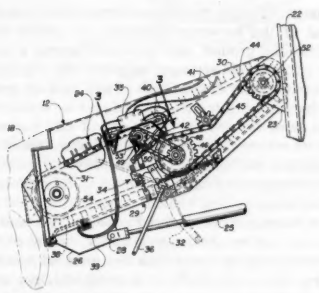
drive means controllably operable for imparting said up and down and traversing movement to said forming bars in a predetermined sequence, and actuating means for moving said forming bars towards and away from each other, whereby said forming bars are moved from said rest position to said position under said spout at the conclusion of a bag filling operation in embracing juxtaposition to the top end of a filled bag, moved towards each other by said actuating means to firmly grip a filled bag and press its front and rear faces closed at the top end thereof, moved downwardly to controllably lower the filled bag onto said conveyor means and then transversely moved back towards said rest position along said conveyor means to deliver a filled bag with its top end held closed to a bag closing station.

4,322,933

STONE TRAPDOOR TRIP MECHANISM

Shaun A. Seymour, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 25, 1980, Ser. No. 181,273
Int. Cl.³ A01F *12/10*
U.S. Cl. 56—10.2 **6 Claims**



1. In an infeed housing having:

(a) a rigid frame with an inlet end and an outlet end connected by a pair of opposing sides interconnecting a top covering and a floor, the floor further having a mounted door movable between a first closed position and a second open position;

(b) conveying means movably mounted within the infeed housing effective to convey crop material from the inlet end to the outlet end;

(c) shaft means rotatably mounted to the infeed housing connected to the conveying means;

(d) drive means connected to the shaft means effective to drive the conveying means;

(e) stone sensing means connectable to the infeed housing effective to detect the presence of stone-like objects among the crop material;

(f) control means cooperable with the stone sensing means to receive an input signal from the stone sensing means when a stone-like object is detected and to send an output signal;

(g) a solenoid fastened to the infeed housing connectable to the door and the control means so as to receive the output signal from the control means;

(h) release means movably mounted to the frame and cooperable with the door and the shaft means effective to selectively permit the door to move from the first closed position to the second open position; and

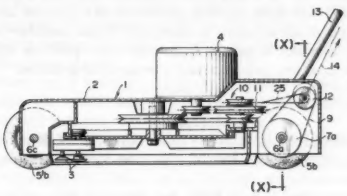
(i) a spring wound clutch mounted about the shaft means cooperable with the solenoid and the release means and movable between a first non-power transferring position and a second power transferring position so that upon receipt of the output signal by the solenoid the clutch is moved from the first non-power transferring position to the second power transferring position thereby causing the release means to release the door to move the door from the first closed position to the second open position.

4,322,934

LAWN MOWER

Hachiro Doi, Saitama, Japan, assignor to Fuso Keigokin Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1980, Ser. No. 117,355
Claims priority, application Japan, Nov. 26, 1979, 54-153160
Int. Cl.³ A01D *69/06*
U.S. Cl. 56—11.1 **8 Claims**



1. A lawn mower comprising:

a lawn mower body frame including a motor and an operatively connected transmission means;

said lawn mower body frame being supported by front and rear wheel means, at least said rear wheel means being independently supported on separate first and second shaft means which are rotatably disposed with respect to said lawn mower body frame;

first and second pulley means concentrically positioned upon each of said separate first and second shaft means, respectively, in opposing, spaced apart relationship to define a gap therebetween;

belt means disposed in said gap and operatively connected to said motor means through said transmission means, said belt means being under a predetermined tension to normally impart rotation to said rear wheel means; and

said first and second pulley means, said separate first and second shaft means and said rear wheel means being positioned relative to each other to permit slippage between said first pulley means positioned on said first shaft means and said second pulley means positioned on said second shaft means when a predetermined load is applied to one of said rear wheel means to facilitate a change in the direction of said lawn mower.

4,322,935

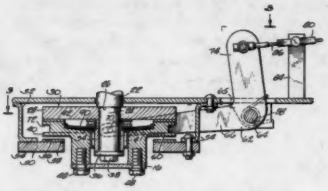
LAWN MOWER INCLUDING A SAFETY CLUTCH AND BRAKE

Arthur G. Poehlman, West Bend, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 8, 1980, Ser. No. 185,332
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—11.3 **23 Claims**

1. A lawn mower comprising a housing, an engine supported by said housing, a drive shaft driven by said engine, a clutch member driven by said drive shaft, a brake member spaced from said clutch member and fixedly connected to said housing, a drive member disposed between said clutch member and said brake member and movable between a drive position wherein said drive member frictionally engages said clutch

member and is rotatably driven by said clutch member and a brake position wherein said drive member frictionally engages said brake member and is restrained against movement, a cutter blade connected to said drive member and rotatably driven by said drive member, means for selectively moving said drive member between said drive position and said brake position,



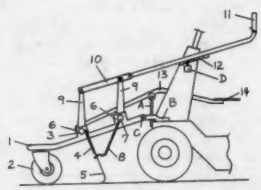
and first spring means for forcing said drive member toward said drive position when said drive member is moved from said brake position toward said clutch member and past a position intermediate said drive position and said brake position, and for forcing said drive member toward said brake member when said drive member is moved from said drive position toward said brake position and past said intermediate position.

4,322,936

SELF CLEARING RAKING ATTACHMENT FOR MOWER

Sherwood W. Whitney, Rte. 6, Box 214-A, Okeechobee, Fla. 33472

Filed Feb. 9, 1981, Ser. No. 232,726
Int. Cl.³ A01D *7/00, 51/00*
U.S. Cl. 56—16.1 **3 Claims**



1. A self-cleaning raking attachment for the front end of a riding lawn mower or other powered vehicle comprising;

a generally U-shaped frame member having a forward end and a rearward end,

means at the rearward end for coupling said frame member to the front end of said mower or said vehicle,

a pair of swivel wheels mounted at the forward end of the frame member for supporting said attachment above the ground, a first and a second shaft member mounted transversely of the frame and mounted on said frame member spaced from each other in a forward and reward direction, a first set of tines attached to said first shaft member, a second set of rigid finger-like tines attached at right angles to said second shaft member to form a comb-like structure, each of said tines of said second set extending between the tines of the first set, means mounting said first and second shafts permitting partial rotation of said shafts, a first and second arm extending radially upward from each of said shafts, a third arm rotatably connected to each of said first and second arms by pins forming a parallel linkage with said frame member,

a handle extension arm connected to said third arm extending rearward for adjusting the degree of rotative angle of said shafts,

a lift arm secured to said frame member for raising the frame member, said lift arm extending rearward, a foot pedal mounted at the rear of the lift arm for control by an operator,

a fulcrum element mounted fixed relative to said mower or said vehicle and operably extending to said lift arm providing the fulcrum point for lifting said frame,

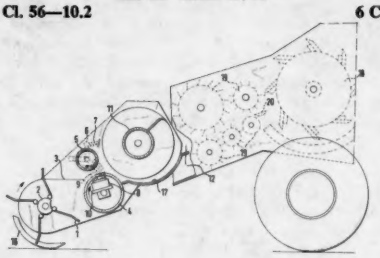
whereby upon lifting of said frame by said operator cleaning of the first set of tines is accomplished by said second set of tines.

4,322,937

HARVESTER WITH INTERNAL METAL DETECTOR

Bernd Hollmann, Bielefeld, Fed. Rep. of Germany, assignor to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,190
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940201
Int. Cl.³ A01D *69/10*
U.S. Cl. 56—10.2 **6 Claims**



1. In a harvester of the type comprising a pick-up mechanism at one end of the harvester operative to gather harvested material from the ground, said harvester having a transverse spiral conveyor therein arranged adjacent said one end of said harvester immediately downstream of said pick-up mechanism to receive harvested material from said pick-up mechanism and to feed the same toward the other end of said harvester, the improvement wherein said harvester includes a metal detector located adjacent said one end of said harvester between said pick-up mechanism and said transverse spiral conveyor, said metal detector comprising a shield structure disposed adjacent the path of movement of material passing from said pick-up mechanism to said transverse spiral conveyor and providing a nonconductive surface over which said material passes, means for effecting movement of the said nonconductive surface of said shield structure to assist in the transport of said material from said pick-up mechanism toward said transverse spiral conveyor, and sensor means mounted at a fixed position on said harvester adjacent said shield structure, said sensor means being operative to produce a metal detecting field which penetrates said nonconductive surface and extends through the path of movement of material that is passing from said pick-up mechanism along said moving nonconductive shield surface to said transverse spiral conveyor.

4,322,938

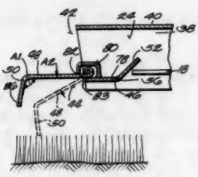
DEFLECTOR MEMBER FOR A ROTARY LAWN MOWER

James F. Efflandt, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 1, 1980, Ser. No. 192,864
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—320.2 **13 Claims**

1. A lawn mower comprising a housing enclosing a rotary cutting blade and including a sidewall having therein an opening and a generally horizontal grass discharge passage extending from said opening, a member carried fixedly by said housing and extending in said grass discharge passage and including an inner edge portion located adjacently outside the periphery of the path of cutting blade rotation below the plane of cutting

blade rotation, and an oppositely spaced outer edge portion located below the plane of cutting blade rotation, and a lip



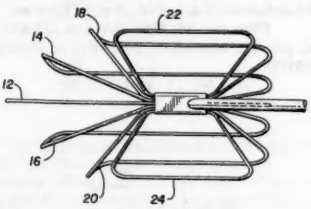
extending generally vertically downwardly from said outer edge portion.

4,322,939

DEVICE FOR GATHERING FRUIT

Charles J. McDonald, Rte. 6, Box 136, Plant City, Fla. 33566

Filed May 23, 1980, Ser. No. 152,980
Int. Cl.³ A01D *51/00*
U.S. Cl. 56—328 R **5 Claims**



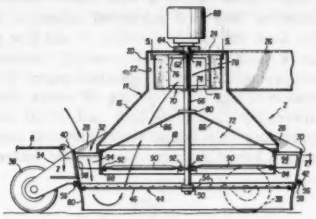
1. A gatherer device which comprises:
a plurality of separate tines each having an upper longitudinal portion and a lower longitudinal portion with curved rear end portions and curved front end portions,
each of said tines secured along their upper longitudinal portion in side-by-side relationship in the same plane,
one of said tines secured with its upper and lower longitudinal portions in the same vertical plane,
a first pair of separate tines secured on opposite sides of said vertically secured tine with their lower longitudinal portions equally spaced from said vertically disposed tine and in the same horizontal plane with said lower longitudinal portion of said vertically extending tine,
a second pair of separate tines secured outwardly of said first pair of tines with their lower longitudinal portions equally spaced from the lower longitudinal portions of each tine of said first pair of tines and in the same horizontal plane,
a third pair of separate tines secured outwardly of said second pair of tines with their lower longitudinal portion raised above the horizontal plane including the lower longitudinal portions of said first and second pairs of tines with the lower longitudinal portion of each tine of said third pair of separate tines on a vertical plane spaced from the lower longitudinal portions of each tine of said second pair of tines,
whereby the spacing between the front curved ends of said tines is sufficient to easily pass fruit to be gathered and the spacing between the lower longitudinal portions of each of said tines and the spacing between the curved rear portions of said tines is of a spacing through which gathered fruit will not pass.

4,322,940

HARVESTING MACHINE FOR MACADEMIA NUTS

Henry J. White, White Sands Village, 77-6469 Alii Dr., Kailua-Kona, Hi. 96740

Filed Feb. 17, 1981, Ser. No. 234,475
Int. Cl.³ A01D *46/00*
U.S. Cl. 56—328 R **13 Claims**



1. A harvesting machine for macademia nuts, comprising:
a shroud having an open bottom, and arranged to be mounted for movement across the ground;
housing means mounted on said shroud, and including a discharge spout;
blower means associated with said housing means, and operable for establishing an upward air flow through said shroud and out said discharge spout;
annular director ring means mounted on the lower end of said shroud and extending substantially completely about the periphery thereof in annular spaced relationship;
impeller means carried by said shroud, and operable for establishing an annular flow of air downwardly through the annular space between said detector ring and the lower end of said shroud, said impeller means and said director ring being arranged and cooperating with each other so that said annular flow extends substantially completely about the lower end of said shroud, and said director ring being arranged to direct said downwardly flowing air inwardly and downwardly beneath substantially the entire periphery of said shroud for dislodging macademia nuts from crevices in the ground upon which said harvesting machine is operated, and said blower means being arranged to generate an upward air flow within said shroud sufficient to capture and ingest freed macademia nuts and discharge them through said discharge spout.

4,322,941

WIRE STRANDING MACHINE WITH MULTIPLE BOBBINS ALTERNATELY LOADED AND USED FOR STRANDING

Marcello Sarracino, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

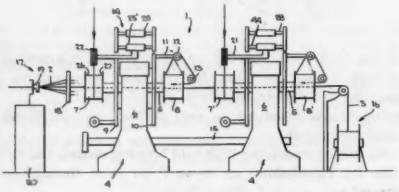
Filed Oct. 22, 1980, Ser. No. 199,423
Claims priority, application Italy, Oct. 31, 1979, 26952 A/79
Int. Cl.³ D07B *3/04*
U.S. Cl. 57—16 **14 Claims**

1. A stranding machine unit for supplying wire to a stranding station, said unit comprising:
a supporting stand;
a hollow shaft rotatably mounted on said stand and extending outwardly of two opposite sides of the stand;
drive means connected to said shaft for rotating said shaft;
a first bobbin for carrying wire rotatably mounted on said shaft at one of said sides of said stand;
a second bobbin for carrying wire rotatably mounted on said shaft at the other of said sides of said stand;
first wire paying-off means rotatably mounted on said shaft intermediate said first bobbin and said stand;
means for alternately connecting said first paying-off means to said shaft for rotation therewith and disconnecting said first paying-off means from said shaft;

second wire paying-off means rotatably mounted on said shaft intermediate said second bobbin and said stand;

means for alternately connecting said second paying-off means to said shaft for rotation therewith and disconnecting said second paying-off means from said shaft;

bobbin rotating means comprising a central shaft rotatably mounted intermediate said bobbins, drive means for rotating said central shaft, a first lateral shaft rotatably mounted on said first paying-off means at a position spaced from the axis of rotation of said first paying-off means, a second lateral shaft rotatably mounted on said second paying-off means at a position spaced from the axis of rotation of said second paying-off means, clutch means for alternately connecting each said lateral shaft to and disconnecting each lateral shaft from said central shaft, whereby a lateral shaft connected to the central shaft by



the clutch means is caused to rotate with the central shaft, means interconnecting said first lateral shaft with said first bobbin for causing rotation of the first bobbin with the first lateral shaft and means interconnecting said second lateral shaft with said second bobbin for causing rotation of the second bobbin with the second lateral shaft; and

a wire dispenser for alternately supplying wire to said first bobbin and to said second bobbin, said wire dispenser comprising guiding means for the wire including an arm mounted for movement in a plane parallel to the axis of said hollow shaft, whereby an end of said arm may be moved from adjacent the first bobbin to adjacent the second bobbin and vice versa, and reciprocating means connected to said arm for reciprocating said end thereof parallel to the axis of said hollow shaft and for thereby laying turns of wire on a bobbin in side-by-side relation.

4,322,942

OPEN-END SPINNING METHOD AND APPARATUS

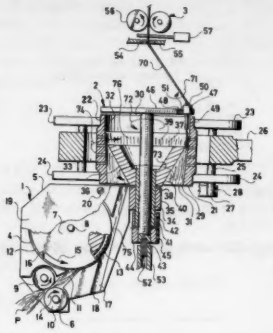
Ludvik Fajt, Prague; Stanislav Didek, Popradska; Jaromir Kasparek, Barcalova; Jaroslav Storek, Cihlarska; Jiri Andres, Dukla; Zelmira Borovcova, Rijnova; Marie Markova, Ceskotrebovska; Marketa Reymanova, Rijnova, and Miroslav Stepanek, Hlavni, all of Czechoslovakia, assignors to Vyzkumny ustav bavinarsky, Usti nad Orlici, Czechoslovakia

Filed Jul. 29, 1980, Ser. No. 173,328

Int. Cl.³ D01H *1/135*

U.S. Cl. 57—411 **23 Claims**

7. An open-end spinning apparatus, comprising a fiber separating device, a spinning device, and a yarn take-off device, comprising a fiber spreading element, a fiber feeding duct directed toward the operating surface of the fiber separating device, a drum coaxial with said fiber spreading element, the drum being provided with an inner fiber deposit surface for receiving the spread fibers, further yarn twisting means radially disposed relative to the axis of said drum, and a thread guide preceding the yarn take-off device, at least one member



of the pair comprising the drum and the yarn twisting means being rotatable about the axis of the drum.

4,322,943

DEVICE FOR JOINING AN UPPER THREAD TO A LOWER THREAD

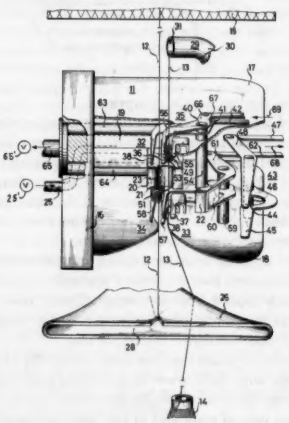
Joachim Rohner, and Heinz Zumfeld, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 16, 1981, Ser. No. 225,635

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1980, 3001918

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—261 **8 Claims**



1. Device for joining an upper thread to a lower thread by splicing, comprising a splicing chamber for inserting and joining the threads, a compressed air canal ending inside said splicing chamber, a thread feeder being movable from a thread receiving position to a thread surrender position for inserting the threads into said splicing chamber, thread cutting means for cutting off ends of the upper and lower threads to produce shortened thread ends, a controllable and adjustable compressed air dosing valve being connected to said compressed air canal, first pneumatic means disposed above said splicing chamber for receiving the shortened thread end of the lower thread, second pneumatic means disposed below said splicing chamber for receiving the shortened thread end of the upper thread, and suction nozzles disposed on said pneumatic means

having screen-like perforated surfaces, said thread cutting means, dosing valve and pneumatic means being controllable as a function of the position of said thread feeder.

4,322,944

METHOD OF AND APPARATUS FOR BREAK SPINNING YARN

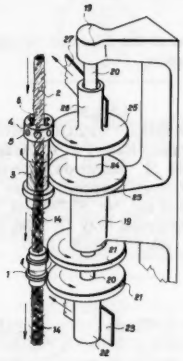
Stanislav Sraitr, and Hana Srejberova, both of Frydlant, Czechoslovakia, assignors to Elitex, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Jun. 11, 1979, Ser. No. 47,039

Claims priority, application Czechoslovakia, Jun. 12, 1978, 3796-78; Aug. 16, 1978, 5325-78; Aug. 16, 1978, 5327-78

Int. Cl.³ D02G *1/20*; D01H *7/92*

U.S. Cl. 57—328 **30 Claims**



1. Method of break spinning yarn in a spinning machine having at least one spinning unit, comprising:

(a) continuously feeding at least one fiber ribbon to each spinning unit of the spinning machine, said ribbon consisting of staple fiber parallelized in the direction of yarn withdrawal to form a ribbon;

(b) imparting a false twist to said ribbon by a false twist imparting element, whereby the front ends of the separate staple fibers are directed in the false twist direction, and the rear ends thereof are directed in the opposite direction;

(c) lifting from the ribbon the staple fiber ends of the thus false twisted ribbon in a respinning twist imparting element which grips and partially releases the staple fiber ends in the false twist direction by a higher speed relative to the false twist imparting speed, the fiber ribbon being given a yarn forming true twist upon further passage through the respinning twist imparting element;

(d) the staple fiber front ends directed in the false twist direction remaining in the respinning twist imparting element in adjacent arrangement to the fiber ribbon;

(e) imparting an additional, true twist to the spun yarn by the remaining and regressively formed false twist; and

(f) winding the finished yarn onto a cross-wound bobbin.

4,322,945

FUEL NOZZLE GUIDE HEAT SHIELD FOR A GAS TURBINE ENGINE

Steven C. Peterson; Leonard W. Stevens, both of Vernon, and Ibrahim S. Tanrikut, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 2, 1980, Ser. No. 136,633

Int. Cl.³ F02C *7/22*

U.S. Cl. 60—39.32 **4 Claims**

1. An annular combustor for a turbine type power plant having a toroidally shaped forward end portion relative to the flow of combustion products flowing therein, a plurality of fuel guide and heat shield members mounted in circumferentially spaced holes formed in said forward end portion for supporting, sealing and protecting fuel nozzles intended to supply fuel to the annular combustor, said fuel guide and heat shield members comprising a sleeve element having a forward flange extending beyond the opening, a flange element being U-shaped in cross section having an upstanding portion spaced from and parallel with said forward flange of said sleeve element, a first ring element and a second ring element being

joined in situ and having a U-shaped cross section with one leg of said first ring parallel to and abutting the face of said forward flange and the other leg of said second ring having a forward face for shielding the fuel guide and heat shield member from the flame in the combustor, a bulkhead having an extended flange parallel to and abutting said leg of said first ring, means for securing said sleeve, said first and second ring and said bulkhead so that said sleeve is in sliding relation to said bulkhead.

4,322,946

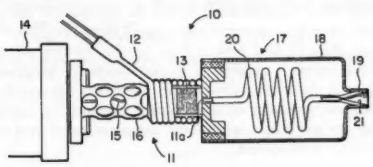
THERMAL THRUSTER WITH SUPERHEATER

Charles K. Murch, Rancho Palos Verdes, and Charles R. Hunter, Lomita, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 543,195, Jan. 22, 1975, abandoned. This application Feb. 5, 1976, Ser. No. 655,361

Int. Cl.³ F02K *9/00*

U.S. Cl. 60—203.1 **7 Claims**



1. A process for producing thrust comprising the steps of:

(a) supplying a monopropellant liquid to a decomposition chamber,

(b) decomposing said liquid within said chamber into gaseous decomposition products at decomposition temperature,

(c) injecting the hot gaseous decomposition products from said decomposition chamber tangentially into a superheater chamber containing a heater on the chamber axis in radially spaced relation to the chamber wall and a nozzle on said axis at the other chamber end in a manner such that the gaseous decomposition products undergo vortical flow through said superheater chamber about and along said heater between the heater and said chamber wall and then exit from the latter chamber thru said nozzle to product thrust, whereby said decomposition products intercept and absorb heat radiating from said heater to said chamber wall during a prolonged residence time in said superheater chamber, and

(d) operating said heater at a temperature such that said decomposition products exit thru said nozzle at a temperature substantially exceeding said decomposition temperature.

4,322,947

CONTROL APPARATUS FOR A FUEL SUPPLY SYSTEM FOR MIXTURE-COMPRESSING, EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINES

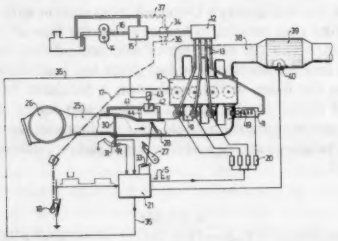
Günter Wössner, Esslingen, and Helmut Maurer, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 916,416, Jun. 16, 1978, abandoned. This application Apr. 8, 1980, Ser. No. 138,392

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728205

Int. Cl.³ F01N *3/00*

U.S. Cl. 60—285 8 Claims



1. A control apparatus of a fuel supply system for mixture-compressing, externally ignited internal combustion engines having a means supplying only fuel of a fuel/air mixture, an induction line and an exhaust line, a throttle member in said induction line, at least one catalytic converter situated in said exhaust line, a temperature sensor for sensing the temperature of said catalytic converter and control means responsive to the temperature of said temperature sensor, further wherein the control means is connected to the means for supplying only fuel, such that the control means interrupts the supply of fuel during overrunning of the internal combustion engine only when the minimum operational temperature of said catalytic converter is exceeded.

4,322,948

INTERNAL COMBUSTION ENGINE WITH AN EXHAUST-DRIVEN TURBOCHARGER

Klaus-Dieter Emmenthal, Wolfsburg, and Günter Hagemann, Gifhorn, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

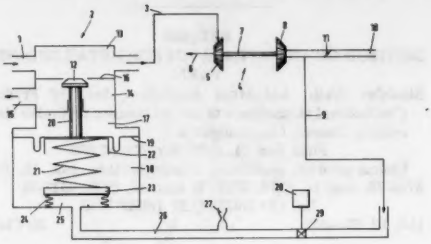
Filed Sep. 28, 1979, Ser. No. 80,008

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1978, 2842685

Int. Cl.³ F02B *37/12*

U.S. Cl. 60—602 4 Claims

1. An internal combustion engine comprising an intake manifold, exhaust driven turbocharger means for generating a maximum boost pressure in said intake manifold, wherein said pressure is so high that knocking may occur, knock sensor means for detecting engine knocking, and valve means coupled to said knock sensor means for temporarily reducing said boost



pressure in response to the detection of engine knocking by said knock sensor means.

4,322,949

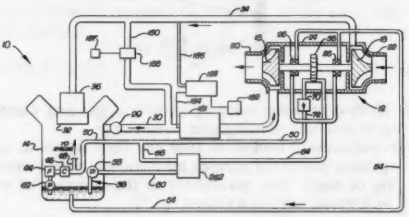
HYDRAULIC ASSIST TURBOCHARGER SYSTEM

Joe L. Byrne, Torrance; Robert J. Kobayashi, Rancho Palso Verdes, and James H. Nancarrow, Torrance, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 57,790, Jul. 16, 1979, Pat. No. 4,285,200. This application May 27, 1980, Ser. No. 153,566

Int. Cl.³ F02B *37/10*

U.S. Cl. 60—606 31 Claims



1. A turbocharger system for supplying charge air to a combustion engine, comprising a turbocharger including a turbine rotatably driven by engine exhaust gases, and a compressor rotatably driven by said turbine for supplying charge air to said engine; an engine hydraulic system including means for supplying hydraulic fluid to said turbocharger for lubrication thereof; an hydraulic turbine coupled directly to said turbocharger; means for selectively supplying a portion of the fluid from said hydraulic system to said hydraulic turbine at a relatively high pressure for rotatably driving said hydraulic turbine fully submerged; a combustor coupled between the engine and the turbocharger for passage of engine exhaust gases; fuel supply means for controllably supplying fuel to the combustor generally in inverse proportion to engine speed; and means for selectively and intermittently bypassing a portion of the turbocharger charge air flow around the engine to the combustor in response to engine operating conditions.

4,322,950

COMBINED INTERNAL COMBUSTION AND STEAM ENGINE

Marshall P. Jepsen, 237 San Ysidro Rd., Santa Barbara, Calif. 93108

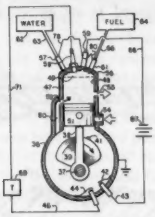
Filed Sep. 22, 1980, Ser. No. 189,894

Int. Cl.³ F01B *29/04*

U.S. Cl. 60—712 5 Claims

1. An internal combustion engine that operates on alternating internal combustion and steam phases comprising:

(a) metal defining a combustion chamber and a working chamber.
(b) a piston reciprocable within the working chamber;
(c) means for introducing fuel into the combustion chamber;
(d) means for introducing water into the combustion chamber;
(e) means for selectively actuating the fuel-introducing means or the water-introducing means;



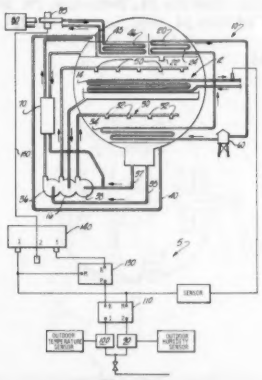
(f) and a sensor for sensing the heat of the metal and connected to the selectively actuating means to actuate either the water-introducing means or the fuel-introducing means, whereby the engine may be operated automatically as a steam engine when the heat of the metal exceeds a predetermined temperature and may be operated as an internal combustion engine when the temperature of the metal is below a preselected minimum.

4,322,951

CONTROL DEVICE AND METHOD FOR CONSERVING FUEL IN AN ABSORPTION REFRIGERATION SYSTEM

Vincent J. Alfano, 15735 James, Southgate, Mich. 48195

Filed May 7, 1980, Ser. No. 147,603
Int. Cl.[3] F25B *15/00*
U.S. Cl. 62—101 **17 Claims**



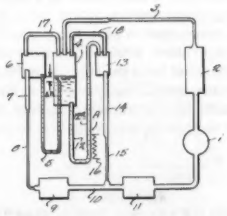
1. A control system for controlling the refrigeration capacity of a refrigeration system in operative relation to control the temperature of a fluid medium for the climate control of building air in response to outdoor air temperature and humidity variations, said refrigeration system comprises a refrigerant; an absorbent having an affinity for said refrigerant; evaporator means for bringing said refrigerant into heat transfer relationship with said fluid medium, said evaporator means having an inlet for receiving said fluid medium to be cooled and an outlet for discharging cooled fluid medium from said evaporator means; absorber means connected to said evaporator means for flow communication therebetween, said absorber means further removing refrigerant vapors from said evaporator means; means for supplying a concentrated absorbent-refrigerant solution to said absorber means; means for cooling said absorber means to maintain the pressure therein below the pressure in said evaporator means whereby said refrigerant vapor flows to said absorber means to combine with said concentrated solution to produce a dilute solution; concentrator means for heating and removing a portion of said refrigerant from said dilute solution to form a vapor so as to control the temperature of said fluid medium and to produce a concentrated solution for recirculation to said evaporator means, said concentrator means further having heat source means and valve means for controlling said heat source means, said valve means having an inlet signal port, said inlet signal port having operatively connected to said valve means to activate said valve means, means for generating a first signal responsive to variations in the temperature of said fluid medium; means for generating a second signal at a predetermined level; minimum position switch means connected to said inlet signal port for terminating the operative effect of said first signal when said first signal is less than said second signal; means for supplying dilute solution to said concentrator means for controlling the concentration of said concentrated solution supplied to said absorber means; said system further comprising:
means for generating a third signal responsive to variations in outdoor air temperature;
means for generating a fourth signal responsive to variations in outdoor air humidity; and
controller means, connected to said first, third and fourth signals for providing a fifth signal as a function of said first, third and fourth signals, said fifth and said second signals further being connected to said minimum position switch means further selecting the greater of said fifth and second signals dependent on its relative value as compared to the lesser of said fifth and second signals and providing a control signal indicative of said one selected signal, said control signal connected to said inlet signal port of said valve means to control said heat means in said concentrator in response to variations in sensed outside air temperature and humidity.

4,322,952

REFRIGERATING APPARATUS

Noboru Nakagawa, Osaka; Toshiyuki Oonishi, Takatsuki; Masato Tsutsumi, Osaka, and Akira Kawamoto, Takatsuki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 27, 1980, Ser. No. 153,133
Claims priority, application Japan, Aug. 8, 1979, 54-101089
Int. Cl.[3] F25B *41/00, 39/02*
U.S. Cl. 62—198 **5 Claims**



1. Refrigerating apparatus comprising:
a compressor for compressing a refrigerant,
at least two evaporators which are controlled to a different temperature by evaporation of said refrigerant,
a tank for storing said refrigerant,
a plurality of conduits for conducting said refrigerant to said compressor, said evaporators and said tank,
a vapor bubble pump for pumping said refrigerant and for controlling the flow of said refrigerant to one of said evaporators, and

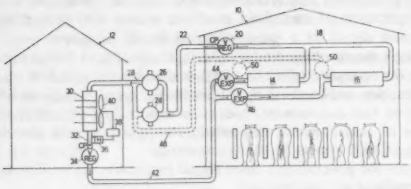
an accumulator which is located on the substantially same liquid level with said tank for delaying the flow of said refrigerant to the other of said evaporators when said vapor bubble pump begins pumping action thereof.

4,322,953

HEAT COLLECTION SYSTEM

Bryan L. Ramlow, Poynette, and Richard R. Steele, Waterloo, both of Wis., assignors to Atmospheric Energy Systems, McFarland, Wis.

Filed May 15, 1980, Ser. No. 150,200
Int. Cl.³ F25B *41/04*; G05D *23/00*
U.S. Cl. 62—217 **4 Claims**



1. A heat collection system comprising:
a first compressor;
a second compressor connected in parallel to the first compressor;
a condenser connected to receive compressed fluid from the compressors, the condenser being located in a space to be heated by heat transferred from the compressed fluid;
a fluid return line carrying fluid away from the condenser;
a fluid expansion valve located in the fluid return line;
at least a pair of evaporators connected in parallel at one end to receive the expanded fluid from the expansion valve and at the other end to supply fluid to the compressors, the evaporators being located in an animal husbandry enclosure, the evaporators both being oversized relative to the compressors so as to remain at a relatively high temperature to avoid extensive cooling of the animal husbandry enclosure;
a first pressure regulating valve connected between the evaporator and the compressor so as to maintain a constant pressure in the fluid transferred to the compressor so that the compressor is not overloaded and so that fluid flow through the evaporator is slowed; and
a second pressure regulating valve connected in the fluid return line adjacent to the condenser to maintain a constant pressure in the condenser so that the fluid temperature in the condenser is maintained at a high level;
the pressure regulating valves acting with the oversized nature of the evaporator to keep the evaporator at a relatively high temperature, while still heating the refrigerant fluid with excess heat from the animals in the enclosure, so that the enclosure is not overly cooled at localized spots, while at the same time maximizing the heat of the fluid at the condenser to provide maximum heat to the space to be heated.

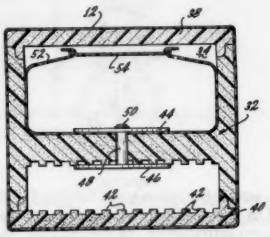
4,322,954

PORTABLE COOLER FOR MEDICINE

Laurence M. Sheehan, 17421 Lori Ann La., Cerritos, Calif. 90701, and John C. Sheehan, 1051 W. 185th St., Gardena, Calif. 90248

Continuation of Ser. No. 41,757, May 23, 1979, abandoned. This application Jun. 11, 1981, Ser. No. 272,645
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—371 **7 Claims**

1. A portable cooler for storing medicine and the like at a desired storage temperature less than room temperature but greater than 0° C., comprising in combination:
body means of insulative material enclosing an upper ice compartment and a lower medicine compartment, and having a wall of insulative material separating the ice compartment from the medicine compartment;
heat tube means disposed within said insulative wall, having a first end extending into the ice compartment and having a second end extending into the medicine compartment, said heat tube being operative to unidirectionally transfer heat from said lower compartment to said upper compartment, when and only when the temperature in said medicine compartment has increased to or above said desired storage temperature;



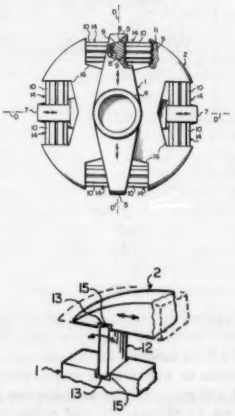
said heat tube means comprising a sealed hollow tube containing a liquid normally resting at the bottom of the tube and in thermal contact with said medicine compartment, said liquid being selected to boil when the temperature of the medicine compartment exceeds a predetermined temperature so that heat is carried by the resulting vapor into the upper end of said tube extending into said ice compartment wherein said vapor is cooled and condensed and thus returns to the bottom of said tube.

4,322,955

FLEXIBLE COUPLING

Albert P. Sfredda, 2106 Iris Pl., Bethlehem, Pa. 18018

Filed May 14, 1980, Ser. No. 149,757
Int. Cl.³ F16D *3/22, 3/64*
U.S. Cl. 64—16 **4 Claims**



1. A flexible coupling comprising: an axially rotatable drive member, an axially rotatable driven member, each said member having a pair of diametrically opposed lugs affixed thereto, two opposing sides of each said lug having flat portions that are parallel to the diametrical center line of said lugs and

perpendicular to the axis of rotation, an axially rotatable floating member having a first pair of diametrically opposed grooves, a second pair of diametrically opposed grooves disposed generally 90 degrees relative to the first pair of grooves, each said groove having two opposed flat portions that are parallel to the grooves' respective diametrical center line and perpendicular to the axis of rotation, said floating member positioned between said drive and driven members in such a manner that the flat portions of each said lug of said driven member are generally centered in respective said grooves of the first pair of grooves, the flat portions of each said lug of said driven member are generally centered in respective said grooves of the second pair of opposing grooves, a plurality of elongated tilting elements, each said tilting element having rounded ends, at least one said tilting element disposed on each side of each said lug and being aligned perpendicular to the flat portions of said lugs, one said rounded end of each said tilting element contacting the respective said flat portion of the respective said lug, the opposite rounded end of each said tilting element contacting the respective said flat portion of the respective said grooves, retaining means for confining each said rounded end of said tilting element to the respective said flat portion of said lug and said groove.

4,322,956

WARP KNITTING MACHINE ARRANGEMENT

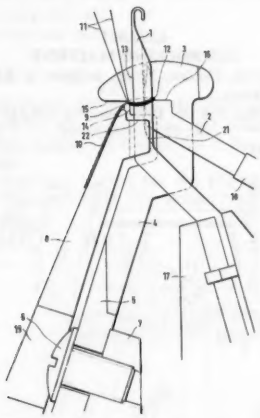
Roland Wunner, Bernstein, Fed. Rep. of Germany, assignor to LIBA Maschinenfabrik GmbH, Naila, Fed. Rep. of Germany

Filed Mar. 3, 1981, Ser. No. 240,149

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008276

Int. Cl.[3] **D04B** *23/00, 27/00*

U.S. Cl. 66—203 **5 Claims**



1. A warp knitting machine arrangement which withdraws a fabric (**10**) over a fixed knock-over edge (**9**) of a knock-over bar (**8**), has a piercing comb including individual sinkers (**3**) movable to and fro between needles (**1**) that hold the fabric, a needle slider for moving each needle, said sinker (**3**) having a lower edge (**15**) extending approximately at right angles to the needles (**1**) in a specific position in relation to the knock-over edge (**9**), characterized in that the lower edge (**15**) forms one side of an approximately right-angled recess which has another side (**14** or **20**) on said sinker (**3**) extending away from such lower edge (**15**) and reaching at least to a level of the knock-over edge (**9**), and said another side (**14**) being adjustable by adjusting the setting of said sinker (**3**) relative to a back (**13**) of said needle (**1**).

4,322,957

APPARATUS FOR DRYING OF TUBULAR FABRICS

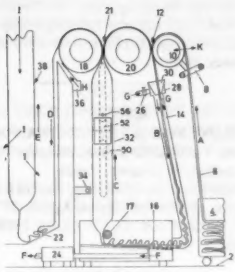
Andrzej N. Nowicki, Melton Mowbray, and David H. Smith, Queniborough, both of England, assignors to Samuel Pegg & Son, Limited, Leicester, England

Filed May 22, 1980, Ser. No. 152,157

Claims priority, application United Kingdom, May 30, 1979, 18778/79

Int. Cl.[3] **D06B** *3/28, 15/02, 15/09, 23/04*

U.S. Cl. 68—13 R **9 Claims**



1. An apparatus for drying tubular fabric including a pair of drivable squeeze rollers forming a water expression nip, a freely rotatable supply roller resting against one of the squeeze rollers to form a fabric transportation nip, a transverse stretching device and air bubble forming means arranged below the water expression nip, a tube for receiving fabric from the fabric transportation nip at an upper end and a draining surface extending under the transverse stretching device and the lower end of the tube for receiving bundled fabric from the tube for passing to the transverse stretching device, and a means for supplying water to the tube for assisting downward fabric movement through the tube.

4,322,958

DOOR LOCK WITH SPRING BOLT AND DEAD BOLT

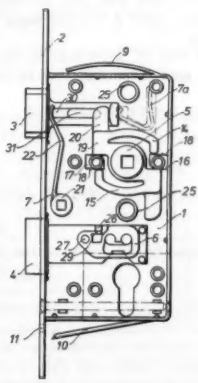
Willi Eigemeier, Friedrichshaller Strasse 66/1, D-7107 Bad Friedrichshall 1, Fed. Rep. of Germany

Filed Jan. 15, 1980, Ser. No. 112,153

Claims priority, application European Pat. Off., Dec. 20, 1979, 791052330

Int. Cl.[3] **E05B** *59/00*

U.S. Cl. 70—107 **11 Claims**



1. A door lock with spring bolt and dead bolt made from

thermoplastic synthetic resin and comprising a box-shaped case part integrally joined to the forend plate and a lock case cover mounted parallel to the lock case bottom, a lock follower body mounted for rotation in the lock case bottom and in the lock case cover and, in inoperative position, resting against retaining pins with a plurality of legs extending from the lock follower body and moving the spring bolt laterally upon radial movement, and a dead bolt held in place by a tumbler, characterized in that

a plurality of legs (**14**) extend from the lock follower body (**5**) and rest without bias against retaining bolts (**17, 18**), that upon radial movement of the lock follower body a plurality of legs bend opposite to the movement of the lock follower body thereby developing spring action, and that a plurality of stops (**17**) limit the rotary movement of the lock follower body.

4,322,959

LOCKING MEANS FOR A TRUNK IN AN AUTOMOBILE

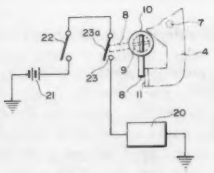
Haruo Mochida, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 24, 1980, Ser. No. 132,773

Claims priority, application Japan, Apr. 6, 1979, 54-46156[U]

Int. Cl.[3] **E05B** *47/04, 65/19, 65/36;* **H01H** *27/06*

U.S. Cl. 70—241 **4 Claims**



1. In a locking means for a trunk in an automobile which can be unlocked by the rotation of a key inserted in a key cylinder of the trunk and which comprises a first switch provided at a proper location in a passenger room of the automobile to open and close a D.C. circuit including an actuator means for unlocking the locking means, the improvement wherein a second switch which is usually closed is provided in said D.C. circuit in such a way as to be opened by the rotation of said key inserted in the key cylinder of the trunk in a direction contrary to that for unlocking the locking means.

4,322,960

MACHINE FOR FORMING OF ROTATIONALLY SYMMETRICAL WORKPIECES

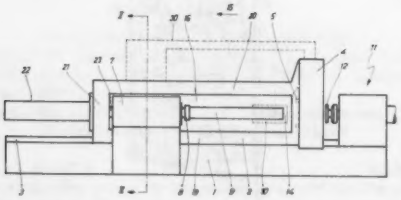
Walther Bosch, Ostfildern, Fed. Rep. of Germany, assignor to Bohner & Koehle GmbH & Co., Esslingen am Neckar, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,272

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1978, 2851384

Int. Cl.[3] **B21D** *22/16*

U.S. Cl. 72—83 **9 Claims**



1. In a machine for spinning or stretching of rotationally symmetrical workpieces, comprising a base on which is mounted a roller head carrier for a multi-roller head having plural shaping rolles which are angularly spaced from each other, a headstock supporting a tool for shaping a workpiece and a pressing tail spindle for a counterholder operatively supporting said workpiece, drive means for effecting a relative movement between said roller head carrier and said headstock for effecting a relative movement between said shaping rollers and said workpiece, one of said roller head carrier and said headstock being fixedly connected to said base and the other of said roller head carrier and said headstock being movably connected to said base, the improvement comprising wherein said roller head carrier has a framelike construction with two horizontal frame elements which are elongated in a longitudinal direction of said machine, a first of said frame elements facing said base and being arranged on said base, a second of said frame elements being spaced from said first frame element, said headstock being located between said two frame elements, said frame elements projecting from the side of said roller head facing said headstock, a recess which extends in the longitudinal direction of said machine, said headstock being arranged in said recess, wherein said two frame elements are fixedly connected to one another at their ends remote from said roller head through a vertical frame element which closes said recess, wherein said drive means on its one side engages said headstock by extending through a hole in said vertical frame and on its other side engages said vertical frame element, the axes of said roller head, said headstock and said drive means coinciding.

4,322,961

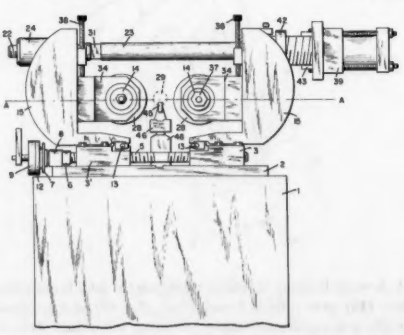
DIE ROLLING MACHINE

Howard A. Greis, Holden, Mass., assignor to Kinefac Corp., Worcester, Mass.

Filed Feb. 26, 1980, Ser. No. 124,916

Int. Cl.[3] **B21B** *31/24*

U.S. Cl. 72—95 **26 Claims**



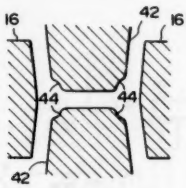
1. A die rolling machine comprising two cylindrical dies for rotating and forming a workpiece on an axis between the dies, means to rotate the dies, means for moving the dies toward each other, a separate die supporting arm for each die, said die supporting arms being pivotable on separate spaced pivot axes, means to pivot said die supporting arms,

the pivot axes for the die supporting arms being substantially parallel with the axis of workpiece rotation and below the latter axis, the means for moving the dies being above said axis.

4,322,962
METHOD OF PRODUCING H-BEAMS

Teruyuki Nakanishi, Kibi, and Kiyoshi Hitomi, Kurashiki, both of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Sep. 11, 1979, Ser. No. 74,501
Claims priority, application Japan, Sep. 12, 1978, 53-112731
Int. Cl.³ B21B *1/12, 27/02*
U.S. Cl. 72—234 **3 Claims**

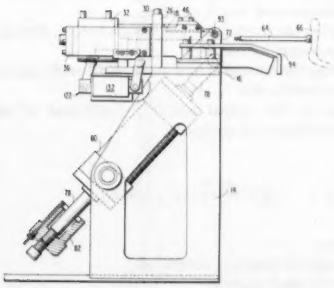


1. An apparatus for producing a steel H-beam having joints of a piece being rolled between a web and flanges having high mechanical strength and toughness, comprising:
a breakdown mill having breakdown rolls;
a first roughing universal mill having horizontal rolls each having concaves in cross-section at portions corresponding to portions at the inner side of each joint between the web and the flanges of the piece being rolled, and vertical rolls;
an edging mill;
a second roughing universal mill having vertical rolls each having a concave in cross-section at a portion corresponding to a portion in the vicinity of the outer side of the joint of said piece being rolled, and horizontal rolls;
a second edging mill; and
a finishing universal mill.

4,322,963
VALVE STEM BENDER AND/OR MARKER

Cecil C. Fitzpatrick, Clarksdale, Miss., and Jimmy C. Spurgat, Rawson, Ohio, assignors to Cooper Tire & Rubber Company, Findlay, Ohio

Filed Apr. 3, 1980, Ser. No. 137,475
Int. Cl.³ B21D *7/03;* **B41F** *17/22*
U.S. Cl. 72—387 **10 Claims**

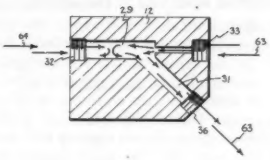


1. An apparatus for bending/marking inner tube valve stems comprising a base member;
a housing secured to said base member;
a cylinder and piston secured to an end of said housing;
a yoke member secured to said piston with the leg portions of said yoke extending in spaced parallel relation to one another along opposite sides of said cylinder and housing;
a pair of side plates carried by said housing;
a clevis member pivotally mounted on the other end of said housing with an aperture in said clevis registering with the interior of said housing for receiving a valve stem;
the free ends of said leg portions having an eccentric shaft mounted therein;
means having indicia thereon carried by said shaft;
a cylinder and piston connected to said clevis;
a source of compressed air;
a pneumatic system connected to said cylinders and said source of compressed air for actuating said piston and yoke to initially move said leg portions and move said means into engagement with a valve stem in said housing and to then pivot said clevis to bend said valve stem.

4,322,964
GAS ANALYZER CALIBRATION APPARATUS

Hans L. Melgaard, and Gary H. Mercier, both of Minneapolis, Minn., assignors to Despatch Industries, Inc., Minneapolis, Minn.

Filed Jan. 14, 1980, Ser. No. 112,135
Int. Cl.³ G01N *37/00*
U.S. Cl. 73—1 G **6 Claims**



1. In a gas analyzer calibration apparatus suitable for use with a gas analyzer, an improvement comprising a fluidic gate for selectively routing a test gas or a calibration gas to the analyzer, said fluidic gate including:
(a) first input means for receiving a test gas at a preselected rate of flow;
(b) second input means for receiving a calibration gas at a second preselected rate of flow that exceeds the first preselected rate of flow;
(c) output means for exiting gases from said fluidic gate to an analyzer;
(d) gate means for substantially blocking a flow of a test gas through said output means in response to a flow of a calibration gas through said second input means and for allowing such calibration gas to exit said fluidic gate through said output means at a rate of flow substantially equal to the first preselected rate of flow, without substantially altering pressure within said output means upon receiving a calibration gas within said second input means.

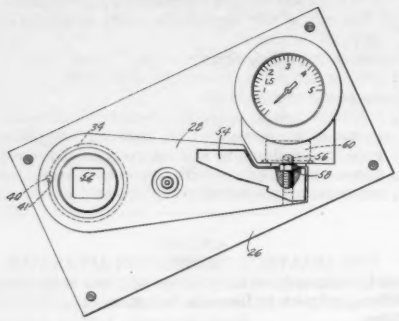
4,322,965
CALIBRATION TEST STAND AND METHOD FOR HYDRAULIC WRENCHES

John H. Bickford, Middletown, Conn., assignor to Raymond Engineering Inc,, Middletown, Conn.

Filed Feb. 25, 1980, Ser. No. 124,282
Int. Cl.³ G01L *25/00*
U.S. Cl. 73—1 C **14 Claims**

1. A calibration test stand for a fluid powered wrench, the test stand including:
base plate means;
pivot plate means pivotally mounted on said base plate means for supporting a wrench to be calibrated;
receiving means connected to said base plate means and fixed relative to said base plate means, said receiving means being shaped to receive an output from a wrench to be calibrated;

reaction means connected to said pivot plate means, said reaction means being adapted to receive a reaction surface of a wrench to be calibrated; and



force measuring means positioned to receive an input from said reaction means, said force measuring means providing a measurement of the output of a wrench to be calibrated for a preselected input load to the wrench.

4,322,966

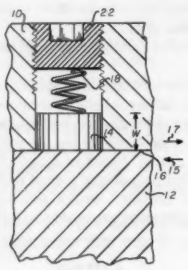
WEAPON CYCLE OR SHOT COUNTER

Robert S. Golabek, Montville, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 26, 1981, Ser. No. 267,143

Int. Cl.³ G01D *21/00*; G06M *1/00*

U.S. Cl. 73—7 **7 Claims**



1. A cycle counter for counting the number of repetitive movements of a first element relative to a second element, comprising:

a. a wear member, said wear member adapted to erode at a predetermined rate correlatable with the number of said repetitive movements,

b. a first element having means for receiving said wear member and a spring biasing means for urging said wear member towards a second element,

c. a second element mounted for repetitive moving relationship to said first element and having a surface in contact with a surface of said wear member, whereby the number of said repetitive movements can be determined by the amount of wear of said wear member.

4,322,967

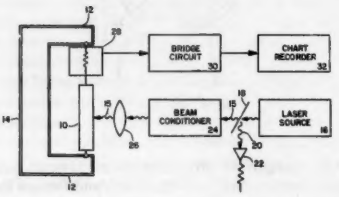
METHOD AND APPARATUS FOR MEASURING OPTICAL COUPLING COEFFICIENTS

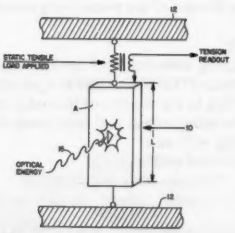
Steven C. Seitel; James O. Porteus, both of Ridgecrest, and William N. Faith, China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1980, Ser. No. 189,401

Int. Cl.³ G01N *25/00*

U.S. Cl. 73—15.6 **8 Claims**





5. A method of measuring the optical coupling coefficient of a sample comprising the steps of:

tensioning said sample a predetermined amount;

illuminating said sample with light of known intensity for a predetermined length of time;

measuring the tension on said sample before, during, and after illumination by said light;

recording the change in tension on said sample due to said light illumination; and

calculating the optical coupling coefficient of said sample according to the equation

$$\alpha = -\frac{1}{E_o}\,\frac{\rho CA}{\Gamma}\,(\gamma_L + \gamma_s)\Delta F(t).$$

where:

α = optical coupling coefficient;

E_o = incident energy;

ρ = mass density of sample;

C = specific heat of sample;

A = sample area;

$\Delta F(t)$ = tensile relaxation;

r = thermal expansion coefficient;

γ_L = elastic compliance;

L_o = unstretched length of sample; and

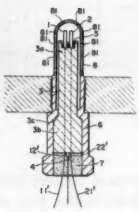
Y = Young's modulus.

4,322,968

TEMPERATURE COMPENSATED PLUG-IN TYPE OXYGEN DETECTOR FOR EXHAUST GAS

Akio Takami; Toshitaka Matsuura, and Tsutomu Saito, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Feb. 25, 1980, Ser. No. 124,023
Claims priority, application Japan, Feb. 23, 1979, 54-23191
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—27 R **5 Claims**



1. A plug-in type, temperature-compensated oxygen detector for detecting oxygen contained in exhaust gas comprising an N type sintered single oxide semiconductor pellet, a P type sintered single-oxide semiconductor pellet, said N type semiconductor and said P type semiconductor having temperature dependencies in the same direction, a ceramic column body for fixedly supporting at one end thereof said N type semiconductor pellet and said P type semiconductor pellet, means for connecting said N type semiconductor and said P type semiconductor in series and providing output terminals at the other end thereof, and a metal housing for fixedly supporting said ceramic column body therein.

4,322,969

GAS PRESSURE RELIEVING HYDROSTATIC TESTER

Frank C. Ball, Long Beach, and Edmund Wardle, Burbank, both of Calif., assignors to Hydro-Test, Inc., Long Beach, Calif.

Filed Sep. 22, 1980, Ser. No. 189,182
Int. Cl.³ G01M *3/08*
U.S. Cl. 73—40.5 R **2 Claims**

1. In combination with a hydrostatic testing device of a structure that includes an elongate mandrel having a lower threaded end, an upper resilient packer mounted on said mandrel adjacent said lower end, a pressurized water inlet in said mandrel that communicates with a first passage that extends downwardly and longitudinally in said mandrel; an elongate member that has an upper threaded end, a lower resilient packer mounted on said elongate member below said upper threaded end, a bow spring and slips assembly mounted on said elongate member, a second longitudinal passage in said elongate member that communicates with an opening in the latter below said lower packer, the improvement for preventing said testing device being blown out of a tubular string when the latter extends downwardly in an oil well bore in which substantial gas pressure may develop, said improvement comprising:

a. an elongate first body having an upper threaded portion that defines a valve seat and a lower threaded end that engages said upper threaded end of said elongate member, said elongate first body having a third longitudinal passage that extends between said valve seat and second passage;

b. an elongate second body that has an upper threaded end that engages said lower threaded end of said mandrel and a lower threaded end that engages said threaded upper end of said elongate first body, said elongate second body having a cavity therein that communicates with said first passage and third passage, and with a pressurized water discharge opening in said second body above said valve seat;

c. a ball in said cavity that may rest on said valve seat and seal therewith; and

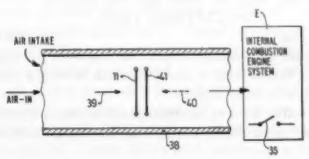
d. a stop in said cavity that limits the upward movement of said ball relative to said valve seat, said testing device when disposed in a tubular string having said upper and lower packers cooperating with the interior surface of the latter, with said ball on said valve seat, to define a confined space into which pressurized water may flow from said inlet, first passage and discharge opening to pressure test said tubular string after the latter has been manipulated relative to said slips and bow springs assembly to set said slips, and said device after a testing operation has been completed capable of remaining in a stationary position in said tubular string when the pressure of gas in said bore hole increases substantially, said gas entering said opening in said elongate member to flow upwardly in said second and third passage to dislodge said ball from said seat and continue to flow upwardly through said cavity and first passage to discharge to the ambient atmosphere through said pressurized water inlet.

4,322,970

METHOD AND APPARATUS FOR CONTROLLING START-UP OF AIRFLOW MEASURING SYSTEMS IN AUTOMOTIVE VEHICLES

Cornelius Peter, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 944,587, Sep. 21, 1978, Pat. No. 4,196,622. This application Dec. 4, 1979, Ser. No. 100,050
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2750050
The portion of the term of this patent subsequent to Apr. 8, 1997, has been disclaimed.
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **11 Claims**



1. Measuring system having

a sensing resistor **(11)** forming a sensing element and chang-

ing resistance in accordance with change of an external parameter to be sensed;

a controlled current source (25) connected to and supplying said sensing resistor with current;

a comparator (15) comparing an output signal representative of current flow through said sensing resistor with a reference (13, 14);

and start-up signal generating means (27, 28) connected to said comparator (15) and applying a minimum signal thereto for comparison with the reference to permit output to be obtained by said comparator and initially control said controlled current source (25) to supply the sensing resistor with current upon start-up of the system.

4,322,971
CONTROLLING THE THICKNESS OF MOVING WEBS OF MATERIAL

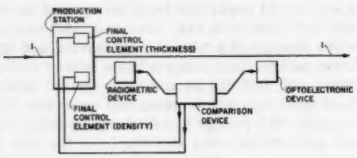
Heinrich Strobel, Hanover, Fed. Rep. of Germany, assignor to Frieseke & Hoepfner GmbH, Erlangen, Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,434

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913879

Int. Cl.³ G01B *15/02*

U.S. Cl. 73—159 **4 Claims**



1. Method of controlling the thickness of moving webs of material comprising the steps of passing the web through a production station containing a final control element for the thickness of the web, locating a radiometric device at the outlet from the production station, after the web leaves the production station moving the web past the radiometric device and, using the device, measuring the weight per unit area of the web, locating an optoelectronic device at a distance from the production station and radiometric device so that the optoelectric device is outside of the range where the web is affected by environmental influences, after the web passes the radiometric device moving the web past the optoelectronic device utilizing laser radiation and measuring the thickness of the web, comparing the measured values from the radiometric device and the optoelectronic device and correcting the measured value of the radiometric device based on the measured value of the optoelectronic device, and conveying the comparative corrected value to a control unit for actuating the final control device for the thickness of the web in the production station.

4,322,972
METHOD AND APPARATUS FOR FLOW-RATE VERIFICATION AND CALIBRATION

Arnold L. Karjala, Apartado 10159, Maracaibo, Venezuela

Filed Aug. 29, 1980, Ser. No. 182,602

Int. Cl.³ G01M *19/00*

U.S. Cl. 73—168 **4 Claims**

1. A flow-rate calibration device for use with a volumetric pump drawing liquid from a tank, the tank having a top and a bottom, the device comprising:

an effluent valve having an open position and a closed position, said valve being connected to the bottom of said tank;

a vertical column comprising:

a top;

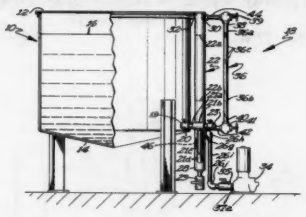
a bottom;

an inlet, said inlet being connected to said effluent valve;

an outlet, said outlet being connected to said pump;

said column having a cross-section which is relatively small compared to said tank, said column extending from said tank top to said tank bottom, and said column top being connected to said tank top;

means for determining the level in said column; and



said inlet to said vertical column being positioned beneath said vertical column outlet and said column extending downwardly below said column inlet to define a sedimentation accumulation chamber in which sediment and other foreign matter may be received and retained before reaching said pump to thereby avoid interference with and unwanted variation of the flow rate of said pump and resultant error in the calibration of the pump.

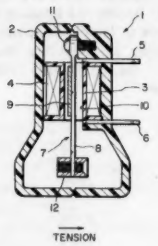
4,322,973
ACCELERATION AND DECELERATION SENSOR

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Aug. 29, 1980, Ser. No. 182,704

Int. Cl.³ G01D *15/11*

U.S. Cl. 73—517 R **6 Claims**



1. A sensor for converting detected acceleration and deceleration into an electrical signal indicative thereof, comprising:

a casing;

a core disposed within said casing, said core including an elastic member with one end thereof being fastened to said casing and the other end thereof supporting a weight so as to force said elastic member into a swinging motion under the influence of acceleration and deceleration;

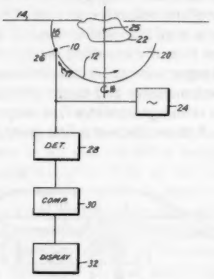
a magnetically soft member of amorphous metal integrally bonded to said elastic member adjacent the fastened end of said elastic member, said magnetically soft member being located on said elastic member such that tensile stress and compressive stress on said magnetically soft member are developed during deceleration and acceleration, respectively; and

an electrical coil wound around said core for sensing the stress values in said magnetically soft member and for providing these values to associated circuitry for conversion to deceleration and acceleration values.

4,322,974
ULTRASOUND SCANNER

Manlio Abele, Garden City, N.Y.; Anthony M. Passalaqua, Glenridge, N.J., and Norman E. Chase, Yonkers, N.Y., assignors to New York University, New York, N.Y.

Filed Feb. 5, 1980, Ser. No. 118,866
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—602 **14 Claims**



1. An ultrasonic scanner for scanning a medium for anomalies scattering acoustic waves, comprising ultrasonic transducing means positioned within scanning range of said medium, ultrasonic transmitting means coupled to said transducing means for providing a train of pulsed ultrasonic carrier signals, each pulsed carrier signal of said train having a constant and unique frequency, said train of pulsed carrier signals together covering a range of frequencies, said transducing means oriented to propagate said train along a path through said medium, means for repeatedly repositioning said transducing means for propagating further trains along a plurality of different paths through said medium, said plurality of different paths together defining a planar cross-section, means coupled to said transducing means and responsive to the steady state phase and amplitude of the received signal to thereby define the total scatter characteristic within said planar cross-section, means for calculating, from said scatter characteristic, a plurality of point characteristics of the acoustic property corresponding to said scatter characteristic, and means for comparing each of said point characteristics with respect to one another for said anomalies.

4,322,975
ULTRASONIC SCANNER

Robert A. Schmidt, Torrance, and Ewell E. Stevens, Northridge, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Feb. 2, 1980, Ser. No. 126,304
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—633 **9 Claims**

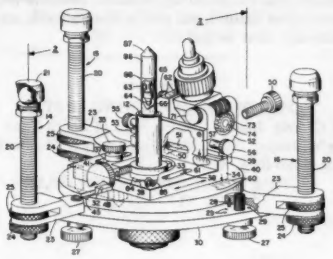
1. Hand-held ultrasonic scanner apparatus for detecting and measuring flaws in a structure comprising:

(a) a base plate member including adjustable leg means mounted thereto,

(b) a spindle means rotatably attaching a rotatable plate member to said base plate member, and

(c) an ultrasonic transmitter/receiver head assembly adjustably mounted on said rotatable plate member,

(d) wherein said leg means includes a plurality of legs, one end of each of said legs being provided with a swivel pad to protect the surface of said structure from damage and to compensate for any variation in the contour of said structure, and adjustment means on the other end of said leg

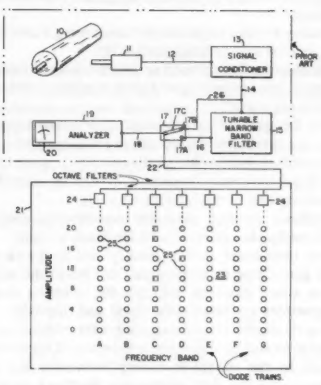


cooperating with clevis means for leg length and angular adjustment relative to said base plate.

4,322,976
MECHANICAL VIBRATION ANALYZER

Edwin D. Sisson, Worthington; Donn V. Stoutenburg, Westerville, and Glen H. Thomas, Worthington, all of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Apr. 4, 1980, Ser. No. 137,551
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—659 **6 Claims**



1. A vibration analyzer comprising:

vibration detector means for converting mechanical vibrations into a corresponding cyclic electrical signal;

an electrical filter having an input for receiving said electrical signal and manually actuable for tuning within a wide range of electrical frequencies to select narrow band portions thereof for submittal at an output;

electrical circuit means having an input and including a visual readout for observing amplitude and frequency values within a said narrow band portion of said range of electrical frequencies selected by said filter actuation;

a visible display comprised of a plurality of light emitting diode trains mutually disposed in parallel adjacency to provide a spectral readout of amplitude and frequency substantially for said wide range of electrical frequencies;

a plurality of octave filters each selecting a unique band of said frequencies within said wide range thereof;

each said train of light emitting diodes corresponding to and responsive to one of said octave filters and each said train including means for illuminating at least one unique diode

in the train corresponding to the instantaneous amplitude of said selected unique frequency band; and

switch means for coupling said plurality of octave filters to receive said electrical signal and alternately for coupling said circuit means input and said plurality of octave filters with said filter output.

4,322,977

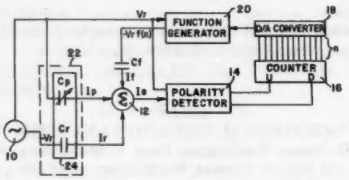
PRESSURE MEASURING SYSTEM

Robert C. Sell; John R. Sheler, both of South Bend, Ind., and John M. Juhasz, Niles, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 27, 1980, Ser. No. 153,129

Int. Cl.³ G01L *9/12*

U.S. Cl. 73—701 **30 Claims**



1. A capacitance to digital conversion system comprising:

means for generating first and second alternating reference signals having a predetermined phase relationship therebetween;

a primary sensing capacitor for measuring a condition driven by one of said reference signals;

a digital-to-analog converter driven by one of said reference signals for converting a digital signal to a first alternating feedback signal;

means for generating a second alternating feedback signal having a predetermined phase relationship with the first alternating feedback signal;

a feedback reference capacitor driven by one of said feedback signals;

a feedback sensing capacitor sensitive to said condition driven by the other of said feedback signals;

means, connected to the primary and feedback capacitors, for generating an error signal related to the sensed condition when currents through the primary and feedback capacitors are other than equal and opposite; and

analog-to-digital converting means for converting said error signal to said digital signal wherein said digital signal is fed back to the digital-to-analog converter for conversion thereby to the first alternating feedback signal and is a measurement of said condition.

4,322,978

OPTICAL DEVICE FOR MEASURING SLIGHT PRESSURE DIFFERENCES BY MEANS OF LIGHT INTENSITY CHANGES

Ingrid Fromm, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

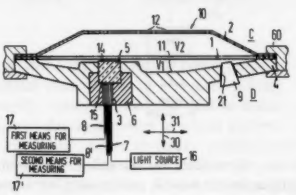
Filed Aug. 27, 1980, Ser. No. 181,697

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1979, 2937511

Int. Cl.³ G01L *9/00*

U.S. Cl. 73—705 **19 Claims**

1. An optical device for measuring slight pressure differences by means of a light intensity change, said device comprising a housing part having a recess; a membrane being secured on said housing part to extend across said recess to form a first chamber of a first volume and having a partially reflective surface facing said first chamber; a protective cap having an opening engaging the other surface of said membrane and forming a second chamber of a second volume opposite said first chamber, said housing part including means for communicating the first chamber with an atmosphere of a desired pressure; a gradient lens with a lens length that amounts to one-fourth of the pitch length, said gradient lens having an axis, a first end face and a second end face; means mounting said gradient lens with the axis of the lens being eccentrically positioned relative to a center of said membrane and the second end face being positioned with a surface parallel to a portion of the reflective surface of the membrane while the membrane is in an idle position and at an interval which is slightly greater than the expected maximum excursion of the membrane; an input waveguide connected to a light source of a predetermined intensity and being coupled to the first end face of the lens at an input point, a first output waveguide being coupled to the first end face at a first point displaced from the



input point and the axis of said lens; first means for evaluating a light intensity being connected to the opposite end of the first output waveguide; a second output waveguide being coupled to the first end face at a second point displaced from the input point and between the axis of the lens and said first point, and a second means for evaluating a light intensity being connected to the opposite end of the second output waveguide, said input point and said first and second points being arranged relative to the lens axis so that when the membrane is at an idle position for a given predetermined pressure in the first chamber, a reflected image of the input point falls on the one end face between the first and second points and as the pressure increases in the second chamber relative to the pressure of the first chamber, the reflected image point moves toward the first point and with a pressure reduction in the second chamber relative to the pressure of the first chamber the reflected image point moves towards said second point.

4,322,979

OPTICAL DEVICE FOR MEASURING SLIGHT DIFFERENCES OF PRESSURE BY MEANS OF A CHANGE IN LIGHT INTENSITY

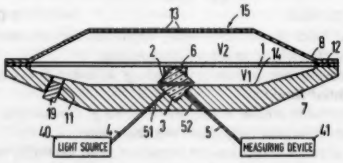
Ingrid Fromm, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 27, 1980, Ser. No. 181,696

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1979, 2937484

Int. Cl.³ G01L *9/00*

U.S. Cl. 73—705 **10 Claims**



1. An optical device for measuring slight pressure differences by means of a light intensity change, said device com-

prising a housing part having a recess; a membrane secured on said housing part to extend across said recess to form a first chamber of a first volume; a protective cap engaging the other surface of said member and forming a second chamber of a second volume opposite said first chamber, said housing part including means for communicating the first chamber with an atmosphere of desired pressure; a right angle isosceles glass prism being mounted in said recess with the hypotenuse surface facing said membrane and extending parallel thereto; an input optical waveguide being coupled to one short side surface of said prism and extending to a light source of a given light intensity for coupling light from said source into said prism; an output optical waveguide being coupled to the other short side surface of the prism for output coupling light from said prism; a surface of the membrane opposite said hypotenuse surface being a light receiving surface, said membrane surface with the membrane in an idle condition being spaced at an interval so that approximately 50% of the coupled in light intensity is totally reflected by the hypotenuse surface; and means for measuring the light intensity being connected to the free end of the output waveguide, so that changes in the pressure in the second chamber relative to the pressure in the first chamber cause a deflection of said membrane to vary the optical light intensity being received by the means for measuring.

4,322,980

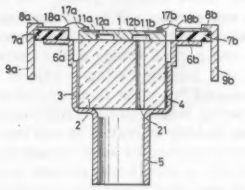
SEMICONDUCTOR PRESSURE SENSOR HAVING PLURAL PRESSURE SENSITIVE DIAPHRAGMS AND METHOD

Seikou Suzuki, Hitachiota; Motohisa Nishihara; Kanji Kawakami, both of Katsuta; Hideo Sato, Hitachi; Shigeyuki Kobori, Hitachi; Hiroaki Hachino, Hitachi, and Minoru Takahashi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 170,663

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—727 **19 Claims**



1. A semiconductor pressure sensor comprising:

a single-crystal semiconductor chip on which at least two pressure sensitive diaphragms are formed;

strain gauge means constructed on the respective diaphragms of said chip to produce output signals, one of the output signals being produced in response to an absolute pressure of atmosphere and the other output signals being produced in accordance with relative values of pressures to be measured with respect to the atmosphere;

electrodes provided on said chip for electrical connection of said strain gauge means; and

an insulating substrate having a thermal expansion coefficient substantially equal to that of said chip and attached to said chip by an anodic bonding method to form chambers together with the diaphragms of said chip, one of the chambers being maintained at vacuum and the pressures to be measured being led to the other chambers.

4,322,981

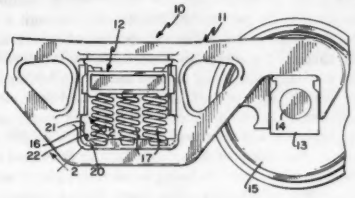
RAILWAY CAR TRUCK FATIGUE DETECTOR

Robert P. Radwill, Chicago, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jul. 10, 1980, Ser. No. 167,239

Int. Cl.³ G01N *3/32*

U.S. Cl. 73—810 **21 Claims**



1. A railway car truck comprising a bolster means and a side frame means at the ends of said bolster means, a fatigue detector means located in an area in said truck wherein said bolster means and side frame means are subject to critical stresses, said fatigue detector means being constructed to assume a normal stress loading which may be assumed by said bolster means and said side frame means without fatigue failure but to fail by fracture under a stress loading less than that causing the failure of said bolster means and side frame means upon the application of said critical stress thereby to warn of potential failure of said truck.

4,322,982

FLOWMETER

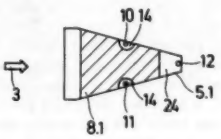
Stefan Müller; Gerhard Thun, both of Karlsdorf, and Wolfgang Glauner, Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,514

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1979, 2905070

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.22 **3 Claims**



1. In a flowmeter for measuring the flow of liquid metal in a conduit having a longitudinal axis; the flowmeter including a magnet for generating a magnetic field in the liquid metal whereby a potential difference is induced in the liquid metal as it flows through the magnetic field and electrodes for measuring said potential difference; the improvement comprising a tubular drag body projecting unilaterally through a wall of said conduit into said conduit in a diametral orientation with respect thereto for generating vortexes in the liquid metal flowing in said conduit; said tubular drag body having a closed surface within said conduit; said magnet and said electrodes being accommodated within said tubular drag body; said tubular drag body having apertures through which project ends of respective electrodes for direct exposure to the liquid metal in said conduit; said electrodes being bonded airtight to said tubular drag body; said tubular drag body further having a triangular cross-sectional shape and said magnet having a triangular cross-sectional shape conforming to the cross-sectional shape of said tubular drag body and substantially filling

the inner cross-sectional area defined by said tubular drag body.

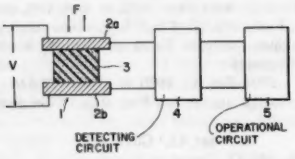
3. In a flowmeter for measuring the flow of liquid metal in a conduit having a longitudinal axis; the flowmeter including a magnet for generating a magnetic field in the liquid metal whereby a potential difference is induced in the liquid metal as it flows through the magnetic field and electrodes for measuring said potential difference; the improvement comprising a tubular drag body projecting unilaterally through a wall of said conduit into said conduit in a diametral orientation with respect thereto for generating vortexes in the liquid metal flowing in said conduit; said tubular drag body having a closed surface within said conduit; said magnet and said electrodes being accommodated within said tubular drag body; said tubular drag body having apertures through which project ends of respective electrodes for direct exposure to the liquid metal in said conduit; said electroes being bonded airtight to said tubular drag body; said tubular drag body further having, in the zone of said electrodes, an outwardly oriented, axially extending bulging portion for accommodating said electrodes and for intensifying the generation of vortexes.

4,322,983

METHOD FOR GENERATING ELECTRIC SIGNALS AND A PUSH-BUTTON SWITCH MEANS THEREFOR

Ryoichi Sado, Saitama, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1980, Ser. No. 115,223
Claims priority, application Japan, Feb. 2, 1979, 54-11301
Int. Cl.³ G01L *1/18*
U.S. Cl. 73—862.68 **6 Claims**



1. A push-button switching means for producing an electric signal which comprises a resistor body formed of an electrically conductive rubbery elastomer capable of exhibiting an inversion of the electric resistivity thereof with a minimum value of the resistivity when a compressive force applied thereto is varied, at least two electrodes provided on the surface of the resistor body, and a detecting circuit electrically connected to the electrodes and capable of producing an electric signal in response to the maximum value in the electric current between the electrodes across the resistor body.

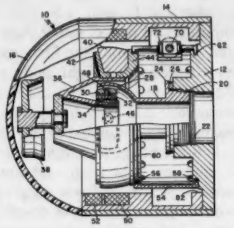
4,322,984

GYROSCOPE CAGE SYSTEM FOR HIGH G ENVIRONMENTS

George Lasker, Claremont, and Paul G. Redman, Upland, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Nov. 15, 1979, Ser. No. 94,406
Int. Cl.³ G01C *19/24*
U.S. Cl. 74—51 **7 Claims**

1. A gyro cage system for supporting a gyro rotor during high g launch of an airborne vehicle, said cage comprising: annular clamping means for surrounding a portion of a gyro rotor for engaging and supporting said rotor and including preloading means for preloading the gyro rotor support bearings, said clamping means being movable between engaged and disengaged positions whereby the rotor is alternately held against rotation and free to rotate; and



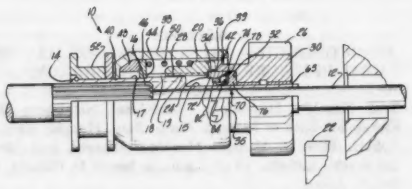
actuating means for selectively moving said clamp between said engaged and said disengaged positions.

4,322,985

ENGINE STARTER WITH AN OVERRUNNING CLUTCH DEVICE

Harold R. Mortensen, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Mar. 20, 1980, Ser. No. 132,012
Int. Cl.³ F02N *15/06*; F16D *43/06*
U.S. Cl. 74—6 **10 Claims**



1. An engine starter having a shaft comprising:

a sleeve member slidably and nonrotatably mounted to said shaft, said sleeve member having one end portion, an opposite end portion and an intermediate portion interposed said one end portion and said opposite end portion, said one end portion having a first outer diameter, said opposite end portion having a second outer diameter larger than said first outer diameter and said intermediate portion having helical splines formed thereon;

a pinion gear slidably journalled on said first outer diameter of the sleeve member for axial movement relative to said shaft, said pinion gear further adapted for movement into and out of engagement with the gear of the engine to be started;

a driving clutch member coaxially disposed with said shaft, said driving clutch member having one end and an opposite end, said one end portion having axially extending dentil clutch teeth, said opposite end being slidably mounted on said helical splines of the sleeve member;

an annular driven clutch member slidably mounted on said first outer diameter of the sleeve member and interposed said pinion gear and said driving clutch member, said annular driven clutch member having a first end secured to said pinion gear, and a second end opposite said first end, said second end having axially extending dentil clutch teeth to engage said clutch teeth on said driving member, said clutch teeth on said driving and driven clutch members further having inclined complimentary mutually engageable inclined teeth for transmitting torque between said driving and driven clutch members in one direction of relative rotation; and

means, mounted on said first outer diameter on said sleeve

and interposed said driving clutch member and said driven clutch member, for centrifugally separating said driving member in a direction away from said driven member when said driven member rotates above a predetermined speed, said centrifugal separating means further comprising:

an annular ring member abutting said driving clutch member, said annular ring member having an inner radially inclined surface;

an annular retainer member secured to said driven clutch member and mounted adjacent said annular ring member, said annular retainer member having a plurality of recesses formed therein;

a plurality of spherical members annularly disposed in said recesses of said annular retainer member whereby said spherical members move radially in a direction outward from said shaft to move against said inner inclined surface on said annular ring member to cause said driving clutch member to move in a direction away from said driven clutch member and to separate and disengage said clutch teeth on the driving clutch from said clutch teeth on the driven clutch member; and

a ring member mounted to said annular retainer member for guiding said plurality of spherical members within said annular retainer member and for preventing said spherical members from moving axially within said annular retainer member.

4,322,986

VARIABLE RATIO RACK AND PINION GEAR

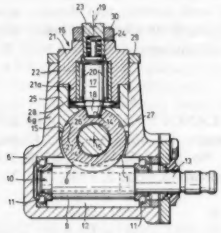
Frederick J. Adams, Clevedon, and Philip A. Downing, Bristol, both of England, assignors to Cam Gears Limited, Hertfordshire, England

Filed Nov. 19, 1979, Ser. No. 95,451

Claims priority, application United Kingdom, Nov. 27, 1978, 46122/78; May 31, 1979, 18997/79

Int. Cl.³ F16H *27/02, 29/20, 1/04*

U.S. Cl. 74—89.18 **18 Claims**



1. A variable ratio rack and pinion gear comprising a housing, a rack member displaceable relative to the housing, a pinion mounted in the housing for rotation about its axis and having teeth engaging with rack teeth on the rack member to displace the rack member upon rotation of the pinion, means for rotating said rack member during displacement of said rack member, said means comprising a non-rectilinear track associated with said rack member and extending in the direction of displacement of the rack and a track follower engaging said track during displacement of said rack member, the reaction between said track and said track follower imparting rotation to said rack member to vary the ratio of the gear, said housing having a portion arranged diametrically opposite to the position of engagement between the rack teeth and the pinion teeth, a support assembly located in said portion of said housing for supporting the rack member with its rack teeth in engagement with the pinion teeth, said support assembly comprising straddle means for restraining displacement of the rack member relative to the housing in opposite directions substantially parallel to the axis about which the pinion rotates, said straddle means having spaced surfaces slidably engaging said rack member at locations to restrain movement thereof in said opposite directions, said straddle means defining a cavity, said track follower at least in part being located in said cavity defined by said straddle means, and means for preventing movement of said straddle means longitudinally with said rack member.

4,322,987

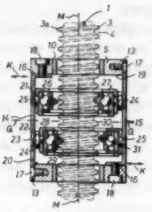
SCREW DRIVE

Robert Gärtner, Freiherr vom Stein Strasse 8, 6308, Butzbach Hessen, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 129,994

Int. Cl.³ F16H *1/18, 27/02*

U.S. Cl. 74—424.8 R **10 Claims**



1. A screw drive, which comprises in combination:

a threaded spindle;

a frame surrounding at least a portion of said spindle and including resilient parts;

a head plate;

a base plate, said spindle being adapted to pass through said head and base plates;

at least one collar bearing supported by said resilient frame parts, arranged eccentrically with respect to the axis of said spindle, and including a radially inner ring provided with an annular bead for engaging the thread of said spindle, said at least one collar bearing being pivotal about an axis located in the direction of the eccentricity of said bearing to said spindle axis; and

at least two leaf springs supported by said frame and forming at least a portion of said resilient frame parts, said at least one collar bearing surrounding a portion of said spindle and being journalled in said leaf springs at right angles to said spindle axis, the leaf springs being connected with the head and the base plates and the collar bearings being laterally displaceable at right angles to said spindle.

4,322,988

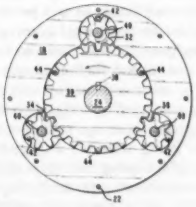
FLUID BRAKED PLANETARY TRANSMISSION

Charles S. Hill, 111 Foster Ave., Olney, Ill. 62450

Filed Feb. 5, 1980, Ser. No. 118,744

Int. Cl.³ F16H *3/44, 57/10*; F16D *31/04*

U.S. Cl. 74—774 **6 Claims**



1. A fluid braked planetary transmission comprising

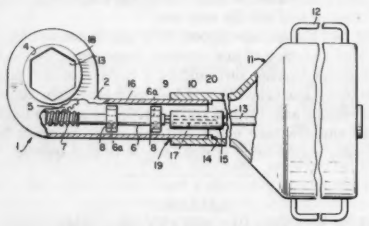
a housing,
rotary coupling means attached to the housing,
a sun gear rotatably supported within the housing,
a shaft attached to the sun gear,
a plurality of planet pinions rotatably supported within the housing in mesh with the sun gear whereby the pinions tend to rotate on their axes as the shaft rotates with respect to the housing,
hydraulic brake means for resisting rotation of the pinions whereby torque is transferred between the shaft and the housing,
means for recovering mechanical energy from the hydraulic brake means,
a gearset carrier that closely envelops the sun gear and the pinions to confine gaps between the teeth of both the sun gear and the pinions,
means for filling the gaps with hydraulic fluid,
the housing having an outlet port adjacent each pinion positioned so as to receive hydraulic fluid displaced from the gaps by meshing of the pinions with the sun gear whereby each pinion may act as a hydraulic pump,
the hydraulic brake means restricting flow from the pumps to create back pressure that resists rotation of the pinions,
wherein the means for recovering mechanical energy includes at least one positive displacement hydraulic motor in series with the pumps,
wherein the housing defines an inlet port adjacent the unmeshing junction of at least one of the pinions whereby each pinion having an inlet port acts as a hydraulic motor, and
wherein the number of pinions acting as hydraulic motors is less than the number of pinions acting as hydraulic pumps.

4,322,989

POWER-OPERATED GEAR-DRIVEN BOX WRENCH

Joseph J. Garolis, 1114 73rd St., North Bergen, N.J. 07047

Continuation-in-part of Ser. No. 864,838, Dec. 27, 1977, abandoned. This application Sep. 17, 1979, Ser. No. 75,960
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.13 **4 Claims**



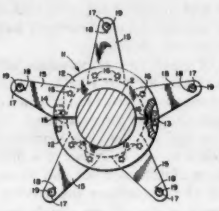
1. Power-operated gear-driven box wrench comprising an encased source of rotational power engaging one end of a first rotatable drive shaft, the other end of said first shaft bearing a first axial coupling member and being encircled by a first rigid coupling collar attached firmly to said power source case and a separate tool holder having a rigid housing retaining a rotatable work engaging gear ring tool and a second rotatable drive shaft, one end of said second shaft engaging said tool through a drive gear and the other end bearing a second axial coupling member and being encircled by a rigid second coupling collar attached firmly to said housing, said first and second axial coupling members being slideably engageable, said first and second coupling collars being slideably engageable, one said axial coupling member and one said coupling collar being sockets having openings with irregular radial dimensions and the other said axial coupling member and the other said coupling collar being mating plugs.

4,322,990

DEVICE FOR SETTING END WORKING TOOLS OF MULTIPLE SPINDLE AUTOMATIC BAR MACHINES

Milton L. Benjamin; Wilbur N. Miles, and Samuel Ecker, all of Chagrin Falls, Ohio, assignors to Erikson Tool Company, Solon, Ohio

Filed Mar. 10, 1980, Ser. No. 128,909
Int. Cl.³ B23B *25/06*; B27G *23/00*
U.S. Cl. 82—3 **2 Claims**



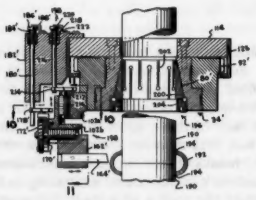
1. In a multiple spindle automatic machine having a spindle drum face, a spindle carrier extension, and an end cutting tool slide in which end cutting tools are axially adjustable to predetermined distances from said spindle drum face, the combination therewith of a device for facilitating such adjustment of said end cutting tools; said device comprising a split-clamp star wheel detachably clamped in a predetermined axial and angularly oriented position on said spindle carrier extension with a locating face thereof coinciding with said spindle drum face and with threaded holes at the points thereof coaxially aligned with the axes of the respective spindles and end cutting tools; and axially pre-adjusted screws in said holes extending axially toward the respective end cutting tools and having end surfaces spaced such predetermined distances from said coinciding locating and spindle drum faces for axial adjustment of said end cutting tools into abutting engagement with the respective end surfaces of said screws; said device, upon adjustment of said end cutting tools as aforesaid, being detached from said spindle carrier extension.

4,322,991

CANOPY CUTTING DEVICE

William C. Feamster, III, 4013 Nina Dr., Chesapeake, Va. 23321

Division of Ser. No. 884,245, Mar. 7, 1978, Pat. No. 4,236,428. This application Mar. 7, 1980, Ser. No. 128,370
Int. Cl.³ B23B *3/26*
U.S. Cl. 82—4 R **9 Claims**



1. A canopy cutting device for machining canopies and the like in constricted spaces, said device comprising a housing including a base plate, a bearing mounted on said housing and having an axis, means for retaining the axis of said bearing in a desired position, a ring gear mounted on said bearing for rotation about said bearing, a cutting tool mounted on and externally of said ring gear, a pinion gear mounted for rotation on said housing and engageable with teeth extending about the outer periphery of said ring gear, means for driving said pinion gear and means for advancing said cutting tool along a line parallel to said axis, means for advancing said cutting tool

along a line perpendicular to said axis during rotation of the ring gear thereby permitting removal of a canopy or the like, wherein said means for advancing said cutting tool includes a cutting tool holder slidably mounted on the ring gear for axial and radial reciprocative movement and supporting the cutting tool, feed screw means for moving said cutting tool holder, indexing wheel means coupled to the feed screw means and extending outwardly beyond the perimeter of the ring gear and carried in a circular path about the axis during rotation of the ring gear and feed pin means positionable in said circular path of movement of the indexing wheel means to intercept and rotate the indexing wheel means through a selected increment for driving the feed screw means to advance the cutting tool holder through one step.

4,322,992

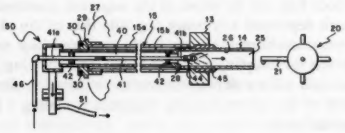
CHIP WASHING SYSTEM

Gerard J. Remillard, Lewisville; Frank Cruz, Sr., Dallas; Daniel W. Devoss, Jr., Mansfield, and Truman A. Miller, Lewisville, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed May 2, 1980, Ser. No. 145,894

Int. Cl.³ B23B *3/36, 51/06*

U.S. Cl. 82—34 R **9 Claims**



1. A chip washing system for a lathe having a spindle, a chuck for holding a workpiece while being rotated by the spindle, and a longitudinal bore extending through the spindle, comprising:

a. a conduit disposed within the longitudinal bore of the spindle;

b. the conduit having one end extending from the spindle exterior to the lathe and the other end extending from the spindle into a longitudinal flow passage defined partially by the inside diameter of the workpiece;

c. means for preventing the conduit from rotating as the spindle rotates; and

d. means for discharging fluid into the one end of the conduit and out the other end of the conduit.

4,322,993

ARRANGEMENT IN A CUTTING APPARATUS FOR ENGAGING AND RETAINING A WEB-LIKE MATERIAL, PARTICULARLY SUPERPOSED MATERIAL WEBS

Günter O. Stumpf, Höhenweg 13, 7421 Mehrstetten, Kr. Münsingen, Fed. Rep. of Germany

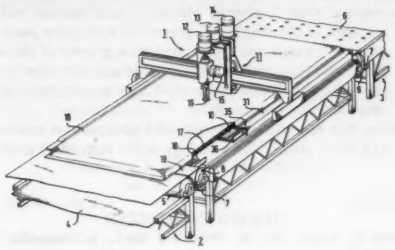
Filed Mar. 6, 1980, Ser. No. 127,847

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908701

Int. Cl.³ D06H *7/24*

U.S. Cl. 83—422 **11 Claims**

1. In an arrangement for engaging and retaining a web-like material, particularly a plurality of superposed webs of cloth; a substantially air-impermeable foil covering the uppermost web of cloth, said arrangement being for a cutting-out machine adapted to be positioned intermediate a material infeed table and material take-off means; an endless bristle band, having an underlying bristle support carrying projection bristles, movable in the material-conveying direction of said cutting out machine; and means, coacting with a vacuum generator, for producing a suction pressure between the bristles of said bristle band acting on said web material; characterized in that the bristle band (10), up to that portion on which the webs of cloth (17) are located, is encompassed by an encompassing wall structure (27,28,31), with the encompassing wall structure (27,28,31) being sealed by sealing means positioned laterally along the side edges of the bristle support (25) for the bristle



band (10) along said material-conveying direction, and that the space defined between the encompassing wall structure (27,28,31) within which the bristle band moves is connected to a vacuum generator.

4,322,994

SHEAR HAVING U-SHAPED CLIPS CONNECTING DRIVE AND WORK PLATES

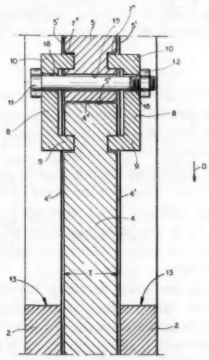
Richard Muhr, Attendorn, and Karl-Heinz Schulte, Lennenstadt, both of Fed. Rep. of Germany, assignors to Muhr und Bender, Attendorn, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,666

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940635

Int. Cl.³ B23D *23/00*

U.S. Cl. 83—616 **7 Claims**



1. A profile-steel shear comprising:

a pair of relatively fixed, spaced-apart, and parallel frame plates;

a drive plate between and displaceable relative to said frame plates in a direction perpendicular thereto, said drive plate having a pair of opposite faces directed perpendicularly to said direction at said frame plates and an end edge generally perpendicular to said direction and to said frame plates, said drive plate being formed on each of said faces with a respective groove adjacent and generally parallel to said edge;

means including an actuator for displacing said drive plate in said direction relative to said frame plates;

a work plate between and displaceable relative to said frame plates in said direction, said work plate having a pair of opposite faces directed perpendicularly to said direction

at said frame plates and an end edge generally parallel to and confronting said end edge of said drive plate, said work plate being formed on each of its said faces with a respective groove adjacent and generally parallel to it said end edge;

respective rigid U-shaped elements each having one leg engaged in the respective groove of said drive plate and another leg engaged in the respective groove of the work plate, said legs being spaced apart in said direction so that said end edges abut when said legs are engaged in the respective grooves; and

means for releasably retaining said elements on said work and drive plates with said legs in the respective grooves.

4,322,995

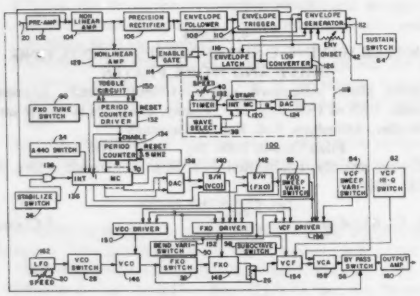
MUSIC SYNTHESIZER

Donald L. Tavel, 233 W. Westfield Blvd., Indianapolis, Ind. 46208

Continuation of Ser. No. 46,198, Jun. 7, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 226,196

Int. Cl.³ G10H *1/055, 1/12*

U.S. Cl. 84—1.19 **3 Claims**



1. In a music synthesizer responsive to an input signal defining a musical note including means to generate a frequency signal and low pass filter means to which said frequency signal is applied, the improvement comprising:

feedback means, including switch means, for coupling the output of said filter means to the input of said filter means through a first lumped fixed resistance whenever said switch means is in one state and through a second, substantially larger, resistance whenever said switch means is in said second state;

said switch means including latching means and first and second switches, said latching means changing between two states in response to each operation of said first switch and said second switch being closed each time said latching means is in one state and open each time said latching means in the other state, said second switch being connected serially with said first resistance and said first switch and first resistance being connected in parallel with said second resistance.

4,322,996

ALTERNATING REPEAT KEYING SIGNAL GENERATOR

William Wangard, Melrose Park, and David Starkey, Oak Park, both of Ill., assignors to Norlin Industries, Inc., White Plains, N.Y.

Filed Apr. 16, 1980, Ser. No. 140,802

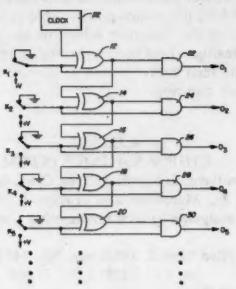
Int. Cl.³ G10H *1/30*

U.S. Cl. 84—1.24 **12 Claims**

1. In an electronic musical instrument having a plurality of playing keys and keying means associable with each of the keys, apparatus for producing alternating repeat keying signals comprising:

means for generating a clock signal;

logic means responsive to said keys and to said clock signal for producing an alternating sequence of logic signals corresponding to each of said keys, the phase of the sequence corresponding to each undepressed key being the



same as the phase of the sequence corresponding to the previous key and the phase of the sequence corresponding to each depressed key being opposite that of the phase of the sequence corresponding to the previous key; and

gate means for coupling a keying signal to the keying means associated with a depressed key in response to the logic signals of the corresponding sequence assuming a predetermined state.

4,322,997

KEYBOARD

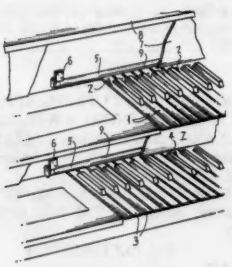
Lawrence G. Anstis, Albury, Australia, assignor to Dorothy Isobel Anstis, New South Wales, Australia, a part interest

Filed Mar. 28, 1980, Ser. No. 134,926

Claims priority, application Australia, Mar. 30, 1979, PD8255

Int. Cl.³ G09B *15/08;* **G10C** *3/12*

U.S. Cl. 84—479 A **3 Claims**

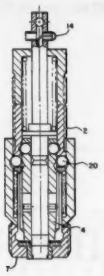


1. A keyboard for a musical instrument comprising a plurality of keys, at least some of said keys having indicia at the exposed surface of the keys, said indicia being formed from a material which becomes visible when exposed to electromagnetic radiation emitted by an illuminating device arranged to direct said radiation onto at least that portion of the keys having said indicia, said indicia being applied to the exposed surface of the keys in an ink which is sensitive to ultra-violet radiation, said illuminating device comprising a low power actinic lamp secured to the instrument in overlying relationship with said keys to direct ultra-violet radiation onto said indicia.

4,322,998
INTEGRAL STORE SUSPENSION AND COMMUNICATION DEVICE

Steven E. Fowler; George N. Hennings; Joseph E. Hibbs; Stephen L. Redmond, and Richard M. Swenson, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1979, Ser. No. 88,494
Int. Cl.[3] F41F 5/02
U.S. Cl. 89—1.5 D 7 Claims

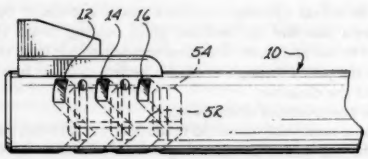


1. An integral store suspension and communication device, ISSCD, comprising:
an internal mechanical suspension means for the suspension of a store;
power transmitting means for supplying and transferring power to and from said store and including separation responsive contacts which charge electrical characteristics to permit sensing store separation; and
information transmitting means for receiving and transferring data to and from said store.

4,322,999
STABILIZING VENT SYSTEM FOR GUN BARRELS

Thomas M. Aston, 928 N. Third, Cottonwood, Ariz. 86326

Filed Aug. 13, 1979, Ser. No. 66,290
Int. Cl.[3] F41C 21/18
U.S. Cl. 89—14 C 35 Claims

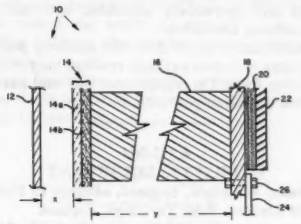


1. A stabilizing vent system incorporated in and as part of a barrel of a firearm for venting the barrel on discharge of the firearm, said vent system comprising in combination:
(a) three sets of vents disposed within the barrel and about the longitudinal axis of the barrel for balancing the force of the dissipating propellant gases in the lateral plane of the barrel each said set of vents including at least two vents in general alignment with each other along the longitudinal axis of the barrel;
(b) an equalizing chamber disposed within the barrel for interconnecting a vent of each set of vents and for equalizing the pressures of the propellant gases at the inlets of said vents, said equalizing chamber including an annular groove disposed in the bore of the barrel;
(c) at least one flute extending parallel with the longitudinal axis of the barrel, each said flute extending radially outwardly from the bore of the barrel to a depth greater than that of any rifling which may exist in the barrel; and
(d) thrust orifices distinct from the vents of said sets of vents and disposed in the upper half of the barrel for dissipating propellant gases generally upwardly.

4,323,000
ARMOR FABRICATION

Dwight L. Dennis, China Lake, Calif., and William A. Mannschreck, Fredericksburg, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1977 Ser. No. 806,021
Int. Cl.[3] F41H 5/04
U.S. Cl. 89—36 A 16 Claims

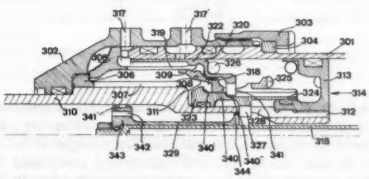


1. A defensive armor system for protection of vital areas of a vehicle or other closed volume comprising:
a first armor including a boron carbide layer and a polyester glass roving mat;
a second armor spaced from said first armor and including an inner layer of elastomeric sheet rubber, an aluminum plate, and about ten layers of ballistic webbing; and
urethane filler material located between said first and second armor.

4,323,001
OPERATING AND BRACING JACK HAVING AN INTERNAL LOCKING MECHANISM

Jean Masclet, Paris, and Jacques Veaux, Chatillon, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed Aug. 21, 1978, Ser. No. 935,575
Claims priority, application France, Sep. 8, 1977, 77 27240; Oct. 20, 1977, 77 31564
Int. Cl.[3] F15B 15/22
U.S. Cl. 91—25 12 Claims



1. A jack, comprising
a cylinder;
a jack bar slidable in said cylinder from a bar extended position to a bar retracted position, said bar including a principal step;
a principal longitudinal catch associated with said jack bar and adapted to engage said principal step in the bar extended position, said catch having a free extremity forming a sloping face;

principal piston locking means cooperating with, said jack bar, said principal piston locking means including a bearing surface complementary to said sloping face and cooperating therewith to urge said principal catch into engagement with said principal step;

cooperating locking and releasing means between said cylinder and said principal locking piston means for urging said principal longitudinal catch into engagement with said principal step for holding said jack bar in the bar extended position and for permitting said principal longitudinal catch to become disengaged from said principal step and urging said jack bar to slide to its bar retracted position;

said locking and releasing means comprises:

an auxiliary step forming part of said principal piston locking means;

auxiliary piston locking means associated with said principal piston locking means and contained within said cylinder;

an auxiliary resilient longitudinal catch connected with said cylinder and operatively associated with said auxiliary piston locking means; and,

locking head means secured to said auxiliary piston means cooperating with said auxiliary resilient longitudinal catch for holding thereof in engagement with said auxiliary step in the bar extended position.

4,323,002

HYDRAULIC EQUIPMENT

Malcolm Wake, Wakefield, England, assignor to Fletcher Sutcliffe Wild Limited, West Yorkshire, England

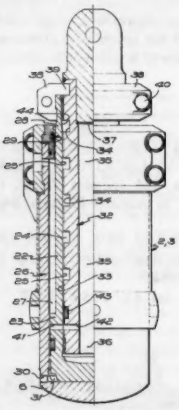
Continuation of Ser. No. 919,291, Jun. 26, 1978, abandoned.

This application May 16, 1980, Ser. No. 150,900

Claims priority, application United Kingdom, Aug. 10, 1977, 33607/77

Int. Cl.³ F15B *15/22, 15/26*

U.S. Cl. 91—25 **4 Claims**



1. A hydraulically actuable piston and cylinder unit comprising a housing forming a cylinder, a piston rod having a hollow interior defined by an internal periphery, a piston head provided on said piston rod and operatively positioned in said cylinder, an outer end of said piston rod located remotely from said piston head, an elongate extension piece having a circular outer periphery, slidably housed, at least partially in a chamber formed by said hollow interior in said piston rod, means to connect said extension piece to said piston rod at an outer end of said piston rod remote from said piston head, said means to mechanically connect said extension piece to said piston rod includes a plurality of outer peripheral grooves axially spaced along said extension piece, a collar removably secured to the outer end of said piston rod, an inwardly projecting flange on said collar for engaging a selected peripheral groove, thereby securely connecting and locking said extension piece in the extended position against movement in either direction, at least one fluid passageway communicating between an outer surface of said piston head and said chamber of said piston rod, and a fluid seal carried by said extension piece and sealing in said chamber against said internal periphery of said piston rod, the arrangement being such that said seal always lies between said fluid passageway and said outer end of said piston rod, whereby said extension piece may be extended to effectively lengthen said piston rod.

4,323,003

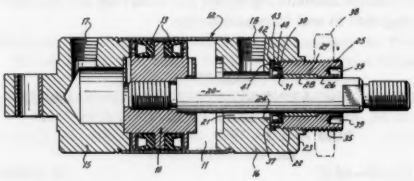
FLUID CYLINDER WITH REPLACEABLE ROD SEAL AND GUIDE

William L. Clippard, III, Cincinnati, Ohio, assignor to Clippard Instrument Laboratory, Inc., Cincinnati, Ohio

Filed Mar. 24, 1980, Ser. No. 132,798

Int. Cl.³ F01B *31/00;* **F16J** *15/18*

U.S. Cl. 92—87 **7 Claims**



1. In a fluid cylinder wherein a piston is pressure operated within a chamber and seal and guide bearing means are provided to seal and guide the movement of a piston rod extending from the piston through an axial bore in a cylinder head at the end of the chamber,

the improvement comprising,

a nose removably mounted in the bore of said head, said nose having means for removing it from said bore through the outer end thereof while the head is mounted to the body,

the nose having an axial opening in which is mounted a guide bearing for said rod, said bearing being mountable in said nose, when the nose is removed from the head, only from the inner end of the nose,

said nose also mounting a rod seal which is received and mounted in said opening axially inward of the bearing,

said nose projecting axially outwardly from an end face of the head,

said bearing at least in part extending to an axial position which is outwardly of the end face of the head, and

means providing a pressure seal between said nose and said cylinder head, wherein said nose has a cylindrical outer surface adjacent its inner end, and

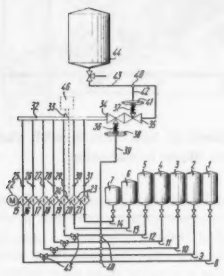
wherein said head presents a peripheral groove in said bore and a ring seal is seated in said groove, the outer surface of said nose engaging and forming a seal with said ring seal.

4,323,004

INSTALLATION FOR PREPARING MULTICOMPONENT LIQUID MIXES IN PRODUCTION OF STRONG ALCOHOLIC LIQUORS

Alexandr I. Sereda, ulitsa Dzerzhinskogo, 34, kv. 8, Yalta Krymskoi oblasti; Ivan F. Nyagu, ulitsa Lenina, 39, kv. 33, Beltsy Moldavskoi SSR; Igor N. Smirnov, ulitsa Narodnogo opolchenia, 20, kv. 363, Moscow; Grigory I. Russu, ulitsa Lenina, 1, kv. 63, and Izrail L. Yasinovsky, ulitsa Ostrovskogo, 46, kv. 12, both of Beltsy Moldavskoi SSR, all of U.S.S.R.

Filed Jun. 2, 1980, Ser. No. 155,608
Int. Cl.[3] B01F *15/04;* B67D *5/08*
U.S. Cl. 99—275 4 Claims



1. An installation for the preparation of multicomponent liquid mixes in the production of alcoholic liquors, comprising:

a plurality of feed tanks adapted to contain respective liquid components;

dispensing pump means including a plurality of dispensing pumps for feeding respective ones of the liquid components;

a plurality of suction pipings, each of said suction pipings communicating between a respective feed tank and a respective one of said dispensing pumps;

header means for collecting said liquid components;

a plurality of delivery pipings, each of said delivery pipings communicating between a respective dispensing pump and said header means;

a receiving tank adapted to receive the mixed liquid components;

a throttling mixer including normally closed hydraulically operated membrane valves arranged substantially at the outlet of said header means, each of said membrane valves being provided with a respective membrane actuator having an above-membrane chamber;

a common delivery pipe communicating between the outlet of said throttling mixer and said receiving tank;

pressure pickups installed on at least some of said suction pipings and on said common delivery pipe and an alcohol content pickup installed on said header means; and

means communicating said above-membrane chambers of said membrane actuators with said suction pipings and common delivery pipe, respectively.

4,323,005

UNIFORM BARBEQUE COOKING OF LARGE MEAT SECTIONS

Larry E. Sconyers, 2115 Windsor Spring Rd., Augusta, Ga. 30906

Filed Nov. 15, 1979, Ser. No. 94,748
Int. Cl.[3] A47J *37/04*
U.S. Cl. 99—400 13 Claims

1. Structure for providing uniformity in barbeque cooking of large sections of meat such as whole hams supported so as to be free of turning or attendant requirements over an extended cooking cycle and to provide for collection of renderings free of contamination of or by a source of heat, comprising

a pit structure with vertically oriented wall means extending upwardly from a pit floor defining an open pit free of flow obstructing compartmentation in the vertical direction,

such pit structure being generally rectangular in horizontal cross-section and having elongated side walls,

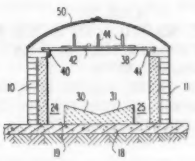
firebox heat source means located contiguous to pit floor level,

rendering collection surface means contiguous to pit floor level, such surface being dimensionally extended horizontally to provide for run-off of renderings from meat sections being barbequed,

such firebox heat source means comprising a narrow-width elongated firebox located contiguous to each such side wall with the rendering collective surface means being located intermediate fireboxes,

drain means communicating with such rendering collection surface means and including passage means for fluids extending between the interior and exterior of the pit structure,

rack means including vertically oriented meat support prongs, the latter being predeterminedly spaced and distributed horizontally,



such rack means presenting an open structure to facilitate vertical movement of heated gases and passage of radiant heat within the pit structure,

rack support means for supporting the rack means within such open pit at a level above such heat source means, such rack support means providing for substantially unobstructed passage of heated gases and radiant heat within the pit structure,

such predeterminedly spaced distribution of meat support prongs locating such prongs for vertically oriented support of meat sections within an area defined by a vertical projection of the rendering collection surface means so as to deposit renderings on such rendering collection surface means, and

pit cover means having a configuration extending over and above meat sections supported on such upright prongs,

such cover means spanning the vertically oriented wall means of the pit structure to confine heat within such open pit and substantially limit escape of heated gases during cooking,

such cover means being movable to provide access to supported meat sections.

4,323,006

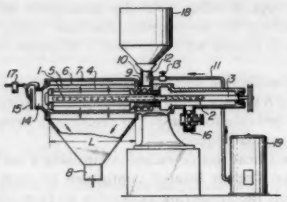
WHITENING APPARATUS FOR SUPER-GLOSSY WHITE RICE

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1977, Ser. No. 819,812
Claims priority, application Japan, Aug. 9, 1976, 51/95190
Int. Cl.[3] B02B *1/04, 3/12*
U.S. Cl. 99—519 5 Claims

1. A whitening apparatus for super-glossy white rice comprising a perforated bran removing and whitening cylinder, a whitening roll rotatably mounted in said cylinder and extending generally coaxially therewith so that said cylinder and said roll define a whitening chamber therebetween, means for

rotating said roll, means for introducing rice into said chamber at a first end of said cylinder, means for removing rice from said chamber at a second end of said cylinder opposite from said first end while maintaining a pressure on the rice within



said chamber, and means for moistening the rice to be whitened, the shortest length of said cylinder being more than twice but less than twenty times the largest diameter of said cylinder.

4,323,007

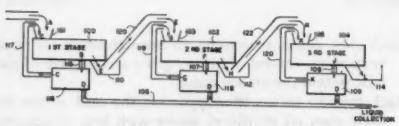
METHOD OF EXTRACTION OF JUICE FROM FRUIT

Arthur J. Hunt, and Arthur J. Hunt, Jr., both of 332 N. Halifax Dr., Ormond Beach, Fla. 32704

Division of Ser. No. 69,174, Aug. 23, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 237,378

Int. Cl.³ B30B *9/16*

U.S. Cl. 100—37 **3 Claims**



1. A method of extracting clear juice from apples or the like comprising the steps of:

(a) introducing the fruit into the input of a first screw type press having a gradual continuous slope of the body of the feed screw;

(b) gently compressing the fruit in the screw type press to express juice and solids from the fruit;

(c) filtering the expressed juice and solids;

(d) separating and collecting the clear juice from the expressed solids; and

(e) reintroducing the separated expressed solids into the input of the screw type press.

4,323,008

VERTICAL BALING MACHINE FOR WASTE MATERIAL

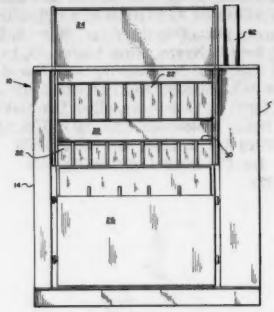
Frank C. Tea, #192 N. County Rd. 312, Bellevue, Ohio 44811

Filed Oct. 14, 1980, Ser. No. 196,695

Int. Cl.³ B30B *1/32*

U.S. Cl. 100—214 **3 Claims**

1. A baling machine comprising a cabinet having side walls, a rear wall, and an open front adapted to be partially closed by movable doors, walls inwardly spaced from said side walls providing closets on opposite sides; a vertically movable pressure platen having guide plates on opposite ends; vertical guide slots in each inwardly spaced wall receiving said guide plates, respectively; fluid pressure means disposed in one closet and operatively connected to said platen; and equalizing means responsive to platen movement to equalize the pressure on both sides of said platen and having parts in each closet, said equalizing means comprising a flexible cable means and sheave



arrangement disposed in said closets with the cable means extending from one closet to the other.

4,323,009

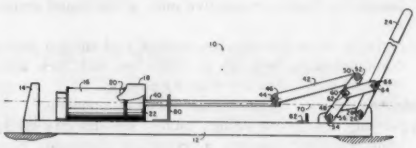
ARTICLE CRUSHING DEVICE

John E. Voigt, 20153 Santa Maria Ave., #21, Castro Valley, Calif. 94546

Filed Sep. 5, 1980, Ser. No. 184,490

Int. Cl.³ B30B *1/04, 9/32*

U.S. Cl. 100—240 **8 Claims**



1. An article crushing apparatus comprising

a base support,

an anvil bracket attached to said base support,

means defining a cylindrical housing having means defining an opening adapted to receive an article to crushed,

a piston disposed in said housing adapted to slidably move in said housing toward and away from said anvil bracket,

an operating handle pivotally connected to said base support, and

means connecting said operating handle to said piston for progressively increasing the ratio of force on said piston to moment-force on said operating handle as said piston approaches said anvil bracket, said last mentioned means comprising,

a first linkage member having one end connected to said piston,

a second linkage member having one end pivotally connected to the end of said first linkage member distal said piston,

a third linkage member having one end pivotally connected to the other end of said second linkage member, the other end of said third linkage member being pivotally connected to said base support, and

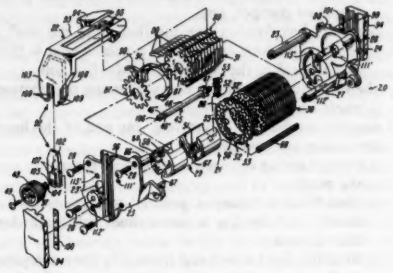
a fourth linkage member having one end pivotally connected to said third linkage member and with the other end of said fourth linkage member pivotally connected to said operating handle.

4,323,010

SELECTIVE PRINTING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 19, 1979, Ser. No. 95,854
Int. Cl.³ B41J 1/22
U.S. Cl. 101—110 12 Claims



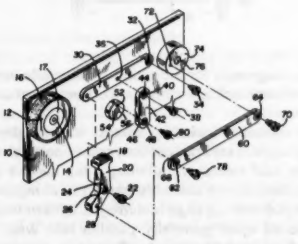
1. A print head, comprising: a series of rotatably mounted wheels, a series of different printing elements for each wheel, each wheel having a generally central hole, a shiftable and rotatable selector shaft movable into the wheel holes and selectably engageable with each wheel for advancing a selected printing element to a printing position, a slide slidably mounted in the space within the wheel holes for supporting the selector shaft, and means coupling the slide and the selector shaft providing for shifting movement of the slide together with the selector shaft but enabling rotation of the selector shaft relative to the slide.

4,323,011

ACTUATING STAMP WITH FREE-TURNING INKING ROLLER

Joel A. Hamilton, 101 Hardenburgh Ave., Demarest, N.J. 07627

Filed Oct. 21, 1980, Ser. No. 199,230
Int. Cl.³ B41F 1/04
U.S. Cl. 101—305 12 Claims



1. Apparatus for applying to a local area and at and with a precise movement an inked stamp reproduction, said apparatus including:

(a) a support means;

(b) a non-powered inking roller rotatably carried on and by a shaft secured to said support, said roller having a periphery adapted to receive, retain and transfer ink to a printing means when brough into contact therewith;

(c) a fourth bar having securing means at both ends thereof and an intermediate mounting means provided by said fourth bar, one end of said fourth bar pivotally mounted to the support means;

(d) a first bar having an extending end and a pivotal mounting means intermediate its ends, said pivotal mounting means attached to the other unsecured end of the fourth bar which is moved by said fourth bar as it is moved around said pivotally secured end, said first bar also having a securing means at the other end of the first bar;

(e) a first eccentric carried by said support means, said eccentric carried by a first shaft and rotated at a given and selected speed;

(f) a second bar having securing and pivoted means formed and provided at each end thereof, one end of said second bar secured to the first eccentric to move in a circular path as established by the eccentric, the other end of said second bar pivotally secured to the end of the first bar;

(g) a second eccentric carried by said support means, said eccentric carried by a second shaft and rotated at a speed that is at least twice the angular speed of the first eccentric;

(h) a third bar having securing and pivoted means formed and provided at each end thereof, one end of said third bar pivotally secured to said second eccentric so as to move in a circular path as established by said eccentric, the other end of said third bar pivotally secured to the intermediate mounting means of said fourth bar;

(i) a stamp having means for securing said stamp to the extending end of said first bar, and

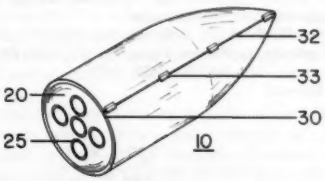
(j) means to advance and move a product in way of said stamp when said stamp is moved by the eccentric toward and to the surface of the product, the movement of the stamp being in a prescribed path as controlled by the two eccentrics, the stamp rapidly and momentarily brought to the product to be marked, the stamp in its travel path also brought to wiping contact of the periphery of the inking roller whereat ink is applied to the stamp and the engagement of the stamp with the roller periphery during inking causing the roller to be inched forward rotationally to present a fresh surface to the stamp when next brought to the inking roller.

4,323,012

LASER-RESISTANT WARHEAD

George J. Driver, Jr., 2416 S. 10th Ave., Caldwell, Id. 83605

Filed Jun. 27, 1980, Ser. No. 163,638
Int. Cl.³ F42B 13/50
U.S. Cl. 102—489 8 Claims



1. A laser-resistant warhead comprising:

a thermal insulative housing including one or more missile holding tubes; and

an ejectable outer shell of ablative composition encasing said housing.

4,323,013

MOBILE TRACK WORKING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 22, 1979, Ser. No. 87,061
Claims priority, application Austria, Nov. 30, 1978, 8583/78
Int. Cl.³ B61B 29/04
U.S. Cl. 104—7 B 5 Claims

1. In a mobile machine for working on a track including two rails rastened to ties, each rail having a head and the rails

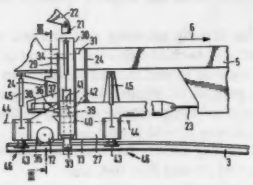
having outsides facing away from each other and insides facing each other in a direction transverse to the track, the machine including a frame and an apparatus for lifting and laterally moving the track in switch areas and open track areas, the apparatus comprising

(a) a tool carrier frame,

(b) power drive means connecting the tool carrier frame to the machine frame for vertically and laterally moving the tool carrier frame in relation to the machine frame,

(c) a single flanged wheel associated with each track rail and supporting the tool carrier frame for mobility on the track,

(1) each flanged wheel having a flange engaging the inside of the associated rail head and serving as a lateral rail



moving element upon lateral moving of the tool carrier frame,

(d) a transversely adjustable gripping hook associated with each flanged wheel and mounted on the tool carrier frame for gripping engagement with the associated track rail from the outside thereof, and

(e) a gripping roller associated with each gripping hook and mounted on the tool carrier frame for grippingly subtending the rail head of the associated track rail from the outside thereof, and for holding the associated track rail during vertical movement of the tool carrier frame,

(1) each flanged wheel being centered between the associated gripping hook and gripping roller in the direction of track elongation.

4,323,014

TIE TAMPER

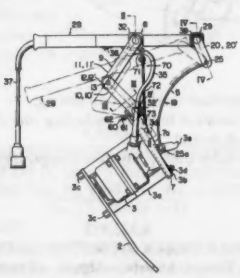
Kazuhide Yamazaki; Shigetoshi Ogawa; Atsushi Suma, all of Tokyo, and Maki Nakajima, Ayase, all of Japan, assignors to Nippon Kokuyu Tetsudo and Kabushiki Kaisha Shibaura Seisakusho, both of Tokyo, Japan

Filed Jul. 24, 1980, Ser. No. 171,814

Claims priority, application Japan, Jan. 17, 1980, 55/3087[U]

Int. Cl.³ B63F *3/02*

U.S. Cl. 104—13 **6 Claims**



1. A tie tamper comprising:

a motor adapted to generate vibration as output;

a beater designed to be thrust at a distal end thereof into ballast gravel and rigidly fixed at its proximal end to the motor to be vibrated thereby;

a handle to be grasped by an operator of the tie tamper;

a link mechanism connecting an intermediate part of the handle to the motor and comprising

a first Neidhart damper secured to the motor and having a non-cylindrical shaft disposed therein,

a second Neidhart damper secured to said intermediate part of the handle and having a non-cylindrical shaft disposed therein,

a first link fixed at one end thereof to the shaft of the first Neidhart damper, and

a second link fixed at one end thereof to the shaft of the second Neidhart damper and pinconnected at the outer end thereof to the other end of the first link,

the first and second links always forming therebetween an angle less than 180 degrees;

a support mechanism connecting one end of the handle to the motor and comprising

a support spring connected at one end thereof to a part of the motor,

a third Neidhart damper, secured to said one end of the handle and having a non-cylindrical shaft disposed therein, and

a third link fixed at one end thereof to the non-cylindrical shaft and connected at the other end thereof to the other end of the support spring; and

a balance weight fixed to said other end of the second link.

4,323,015

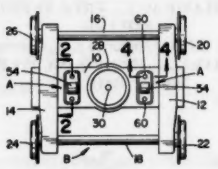
ROLLER SIDE BEARING MOUNTING SYSTEM AND METHOD

George M. Hess, Huron, and James A. Zils, North Royalton, both of Ohio, assignors to Russell, Burdsall & Ward Corporation, Mentor, Ohio

Filed Mar. 31, 1980, Ser. No. 135,480

Int. Cl.³ F16B *5/02, 31/02*

U.S. Cl. 105—199 CB **14 Claims**



1. An arrangement for mounting a roller side bearing assembly to a rail car truck assembly, said arrangement comprising in combination:

a truck assembly including spaced wheels adapted to rollingly support said rail car on a pair of parallel spaced apart tracks, said assembly including a top surface portion;

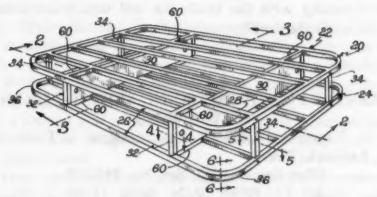
a side roller bearing assembly having an elongated generally U-shaped bearing cage including a bottom wall and a pair of spaced apart generally parallel side walls upstanding therefrom, said bottom wall having at least a pair of spaced apart openings extending therethrough in registry with at least a pair of openings in said truck top surface portion, said bearing cage side walls having at least one cylindrical bearing member extending therebetween adapted to supportingly engage an area of said rail car for reducing frictional forces generated during swivel movement between said car and truck assembly;

an elongated threaded fastener extending through each of said pairs of registered bottom wall and top surface portion openings, said fasteners each having a head and an elongated shank threaded along at least the outermost end section thereof wherein said head and shank interface with each other at a distinct fillet area, said head cooperating with said bottom wall and said shank extending through an associated pair of registered bottom wall and top sur-

face portion openings with said threaded outermost end disposed in threaded engagement with a locknut disposed on the underside of said top surface portion, said threaded fasteners being placed in some desired clampload condition within predetermined upper and lower limits as a function of rotating said fasteners to secure threaded advancement thereof into said locknuts, said desired clampload being less than an amount which would cause failure in said bearing cage and greater than an amount which increases the potential for failure in said fasteners when said fasteners are subjected to bending loads resulting from loading of said roller side bearing assembly during rolling travel of said rail car along said track, said fasteners each further including means for limiting the torque applied thereto during fastener rotation into threaded advancement with said locknuts whereby the resultant fastener clamploads may not exceed said upper limit; and,

bearing means interposed between the head of each fastener and said bearing cage bottom wall to facilitate control of frictional forces occurring at said fastener heads during rotation thereof into threaded engagement with said locknuts, said bearing means further protecting the fillet areas of said fasteners from being imbedded by said bearing cage bottom wall at said bottom wall openings at least when said fasteners are subjected to said bending loads.

4,323,016
WAREHOUSE PALLET
Richard H. Flesher, 1178 Willits Dr., Corona, Calif. 91720, and Lewis E. Massie, 2218 13th St., Olivenhain, Calif. 92024
Filed Jan. 24, 1980, Ser. No. 114,840
Int. Cl.³ B65D *19/30*
U.S. Cl. 108—51.1 **13 Claims**



1. A warehouse pallet comprising:

first tubular steel members comprising an upper grid platform including:

a tubular steel perimeter of generally rectangular cross section and including a first pair of straight sections defining sides of a rectangular outline and a second pair of straight sections defining ends of the rectangular outline, and

tubular steel stringers of generally rectangular cross section extending parallel to the first pair of straight sections of the perimeter and each welded to each of the second pair of straight sections, one surface of the perimeter and one surface of each of the stringers defining an upwardly facing upper plane;

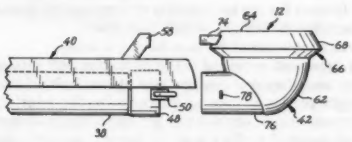
a lower grid platform comprising a plurality of second tubular steel members of generally rectangular cross section and defining a downwardly facing lower plane parallel to the upper plane, at least spaced-apart areas of the second tubular members of the lower grid platform being aligned with and directly below areas of the first tubular members; and

a plurality of support members located between juxtaposed surfaces of the steel members of both of the platforms to hold the platforms in rigidly spaced relation, the support members including:

tubular steel spacer stanchions of generally rectangular cross section extending perpendicularly to the planes of the platforms in line between and welded to the spaced-apart areas of the second tubular steel members and the areas of the first tubular steel aligned therewith, and

additional tubular steel members of rectangular cross section welded to interior regions of the upper platform and to interior regions of the lower platform directly therebelow, the additional steel members and at least predetermined ones of the stanchions defining passageways below the upper grid platform to receive the prongs of a fork-lift to engage the upper grid platform transversely to the longitudinal direction of the stringers.

4,323,017
BURNER APPARATUS
Loren A. Harris, Rte. 1, Box 294, Montague, Calif. 96064
Filed Apr. 16, 1980, Ser. No. 140,712
Int. Cl.³ F23K *3/00*
U.S. Cl. 110—110 **1 Claim**



1. Burner apparatus comprising:

an elongate fuel conduit having a metallic and thus heat conductive wall defining a passage for the supply of fuel,

an elongate air conduit extending in the direction of the fuel conduit, defining a passage for the supply of air, the metallic and heat conductive wall of the fuel conduit separating the fuel and air passages whereby they are in heat exchange relationship, the air conduit having an open end and the fuel conduit having an open end and said ends facing the same direction and being adjacent each other,

a burner unit including, as an integral assembly, a receptacle with an interior for holding fuel and an open top, a shell secured to and surrounding the receptacle defining an air chamber extending about the receptacle, and aperture means in said receptacle for venting air from said chamber into the receptacle,

first entrance-defining means on one side of the burner unit, defining an entrance which passes through said shell and communicates with said air chamber, and second entrance-defining means on the same side of the burner unit, defining an entrance which passes through said receptacle and communicates with the interior of the receptacle, the two entrances facing a common direction to one side of said burner unit,

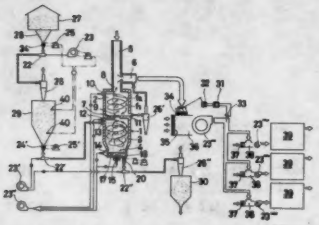
a telescopic fit of said open end of the air conduit with said first entrance-defining means and a telescopic fit of said open end of the fuel conduit with said second entrance-defining means,

releaseable means detachably locking the end of at least one conduit to the entrance-defining means with which it is telescopically fitted preventing relative axial displacement, and said air conduit extends along a side of said fuel conduit, said first entrance-defining means includes a collar joined to and projecting outwardly from said shell, said second entrance-defining means includes a collar joined to and projecting outwardly from said receptacle, and the releasable means detachably locks the end of said fuel conduit to the collar which is joined to the receptacle.

4,323,018
METHOD FOR GENERATION OF HOT GAS BY INCINERATION OF COMBUSTILE MATERIAL AND APPARATUS FOR GENERATION OF HOT GAS BY INCINERATION OF COMBUSTIBLE MATERIAL

Yosimi Iwasaki, Date, Japan, assignor to Hokkaido Sugar Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 139,649
Claims priority, application Japan, Jun. 15, 1979, 54-74568
Int. Cl.[3] F23B *5/04;* F23G *5/00*
U.S. Cl. 110—208 3 Claims



1. A furnace for the incineration of combustible material and the generation of hot gas, which comprises:

a vertical cylindrical furnace having a wall;

a partition wall provided in the center thereof with an aperture and disposed horizontally at one half of the entire height of the furnace so as to divide the interior of the furnace into an upper chamber and a lower chamber,

a stack annexed to the top of the furnace and provided with a side pipe,

a first inlet for air disposed in said wall at the upper end of said upper chamber and positioned so as to open in the direction tangential to said wall of the furnace,

an outlet for dust disposed in said wall at the lower end of the upper chamber and positioned so as to open in the direction tangential to said wall of the furnace and in the same directional sense as that of said first inlet of air,

a second inlet for air and an inlet for combustible material, both disposed in said wall at the upper end of said lower chamber and positioned so as to open in the direction tangential to the wall of the furnace and in the same directional sense as that of said first inlet for air in the upper chamber, and

means for supporting an incandescent layer of ash and an outlet for residue of combustion, both disposed in the bottom section of said lower chamber,

whereby the air and combustible material introduced through said second inlet and said inlet for combustible material form a first spirally descending current of burning material, and whereby a second spirally ascending second current is formed within said first current and passes through said aperture into said upper chamber, and further whereby the air introduced through said first inlet forms a third spirally descending current surrounding said second spirally ascending current in said upper chamber.

4,323,019
METHOD AND APPARATUS FOR PLANTING SEEDLINGS

William H. Haddock, Garner, N.C., assignor to North Carolina State University, Raleigh, N.C.

Filed Dec. 20, 1979, Ser. No. 105,766
Int. Cl.[3] A01C *11/02*
U.S. Cl. 111—2 10 Claims

1. A method of planting tree seedlings or the like in the soil and comprising the steps of

positioning generally vertically with respect to the soil an elongate tube having a cylindrical wall, an open lower end, and at least one radially outwardly extending blade pivotally mounted on an axis extending adjacent to the wall of the tube and in a direction skewed relative to the longitudinal axis of the tube for movement by engagement with the soil between a forward position closing the lower end and rearward position opening the lower end, then

rotating the tube in a forward direction abouts its longitudinal axis and advancing the tube into the soil with the biade at a penetration angle in the range of from about five degrees to about eighty-nine degrees while forming a cylindrical cavity in the soil and pulverizing with the blade the soil which immediately surrounds the cavity, then

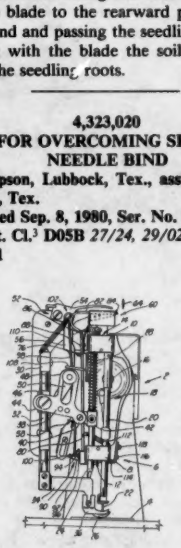
depositing a seedling downwardly into the cavity and such that the foliage is above ground level and the roots are below ground level, and

rotating the tube in a rearward direction about its longitudinal axis and withdrawing the tube from the soil while moving the blade to the rearward position and opening the lower end and passing the seedling therethrough and compacting with the blade the soil which immediately surrounds the seedling roots.

4,323,020
APPARATUS FOR OVERCOMING SEWING MACHINE NEEDLE BIND

Elmer R. Thompson, Lubbock, Tex., assignor to Datho Mfg. Inc., Lubbock, Tex.

Filed Sep. 8, 1980, Ser. No. 185,319
Int. Cl.[3] D05B *27/24, 29/02, 15/00*
U.S. Cl. 112—61 12 Claims



1. An apparatus for limiting the displacement of a presser bar reciprocatingly mounted in a frame of a sewing machine, said apparatus comprising:

contact means for contacting the presser bar after the presser bar has moved a predetermined distance;

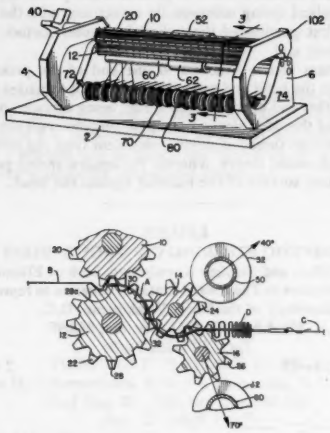
latch means, having said contact means associated therewith, for releasably engaging the frame so that said contact means is prevented from moving in the same direction as the presser bar; and

decoupling means for disengaging said latch means from the frame.

4,323,021
PLEATING AND SMOCKING MACHINE

Dianne R. Durand, 6709 Glen Brook Dr., Knoxville, Tenn. 37919

Filed Mar. 24, 1981, Ser. No. 247,096
Int. Cl.[3] D05B *35/08, 1/04*
U.S. Cl. 112—133 5 Claims



1. A machine for pleating or smocking textile and like material comprising:

(a) a frame formed of a base and spaced parallel end members extending in the same direction from the base,

(b) a first pair of toothed rollers rotatably supported one above the other by end members with their teeth intermeshed,

(c) a second pair of toothed rollers rotatably supported one above the other by the end members with their teeth intermeshed,

(d) the upper roller of the second pair being also intermeshed with the lower roller of the first pair whereby material passed between the two pairs of rollers travels in an S-shaped path and is pleated,

(e) the teeth of each roller being provided at spaced intervals along their lengths with a plurality of aligned circumferential grooves, the aligned grooves of the four rollers forming a plurality of spaced sets of grooves extending throughout the length of the machine,

(f) an S-shaped needle positioned in each set of grooves and supported by the rollers, each needle having a pointed end adjacent the first pair of rollers and a thread receiving eye at its other end adjacent the second pair of rollers,

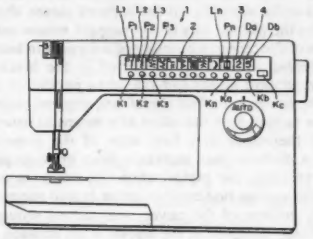
(g) and means forming part of the machine for preventing flexing of the rollers in the direction of the eye ends of the needles.

4,323,022
PATTERN SELECTING SYSTEM FOR ELECTRONIC SEWING MACHINE

Susumu Hanyu, and Kenji Kato, both of Hachioji, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Nov. 27, 1979, Ser. No. 97,871
Claims priority, application Japan, Dec. 6, 1978, 53/149998
Int. Cl.[3] D05B *3/02*
U.S. Cl. 112—158 E 6 Claims

1. A pattern selection system for use with an electronic sewing machine with a memory, in order to allow patterns which have all pattern data stored in the memory to be selected by a user, when the patterns are divided into a first group and a second group, in which groups the patterns in the first group are more frequently used and the patterns in the second group are less frequently used, comprising: a plurality of first pushbuttons, each such first pushbutton being associated with a corresponding one of the patterns in the first group so as to bring the first pushbuttons and the patterns in the first group into one-to-one correspondence with each other; a like plurality of indicator panels, each indicator panel depicting a corresponding one of the patterns and being located adjacent the first pushbutton corresponding thereto; a like plurality of lamps, each lamp being associated with a corresponding one of the indicator panels in a manner that when one of the patterns in the first group has been selected by a user, the correspond-

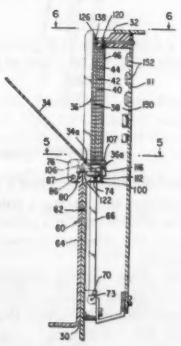


ing panel will be illuminated; a display; at least one second pushbutton located adjacent the display and cooperating therewith in a manner that the display will indicate at least one numerical or alphabetical character identifying a pattern in the second group which has been selected by a user by operation of all such second pushbuttons; and means connected to the memory, all pushbuttons, all lamps, and the display and cooperating therewith in a manner that when a pattern in the second group has been selected by actuating the second pushbuttons, the sewing machine will be programmed to adjust needle movement and feed rate in a manner that the pattern in the second group so selected will be sewn by the machine irrespective of the actuation of the first pushbuttons.

4,323,023
INSTRUCTIONAL FLIP PLATE INFORMATIONAL SYSTEM

Howard L. Beckerman, Middletown, and Allan M. Dob, Clifton, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Oct. 20, 1980, Ser. No. 202,207
Int. Cl.[3] D05B *3/02*
U.S. Cl. 112—158 F 11 Claims



1. In a sewing machine, a standard with a recess and a substantially flat outer surface adjacent thereto; a cover for the

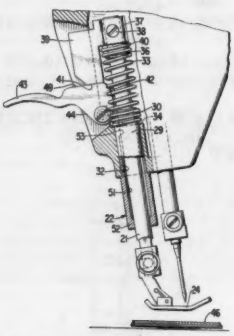
recess including substantially flat inner and outer surfaces; means mounting the cover for movement between a closed position over the recess in which the flat outer surface of the cover is substantially coplanar with the flat outer surface of the standard, and an open position wherein the flat outer surface of the cover lies opposite the flat outer surface of the standard, said mounting means including cover support means pivoted within the standard at a location remote from the bottom edge of the recess for movement about an axis substantially parallel thereto, and extending to a region within the recess in the standard where the support means includes support brackets extending toward the cover, said mounting means further including brackets extending from the inner surface of the cover, and axle means connecting the brackets from the support means with the brackets from the cover to render the cover pivotally movable on the support means about an axis parallel to the pivotal axis of the support means and said bottom edge of the recess; a plurality of information bearing plates in said recess; axle means supported in the brackets of the elongated support means and extending parallel to the pivotal axis of the cover but offset therefrom; support projections on the plates mounted on the offset axle means to extend perpendicularly therefrom to a first edge of the respective plate through a distance that increases from plate to plate by an amount enabling the plates when the cover is open to be stacked flat against one another either in said recess or against the inside surface of the cover, and moved sequentially between alloted positions in the stacks; a tab on each of at least selective ones of the pivoted informational plates on a second edge remote from the said first edge of the plate; and fixed members in said recess aligned with respective tabs and off-set from each other to engage the aligned tabs when the plates are stacked flat in said recess.

4,323,024

PRESSER BAR GUIDE

Gary D. Jones, Short Hills; Manfred R. Laidig, Whippany, and William Weisz, Tenafly, all of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Apr. 21, 1980, Ser. No. 141,879
Int. Cl.³ D05B *29/02*
U.S. Cl. 112—237 **4 Claims**



1. In a sewing machine that comprises a loop-taker, a head spaced from the looptaker and having a round channel facing generally towards the looptaker, and a presser bar that extends longitudinally through the channel, presser bar support and guide means comprising:

a hollow presser bar guide bushing comprising a first portion adjacent a first end of the bushing, the first portion having a circularly cylindrical outer surface that extends through and substantially fills the channel, and a second portion between the first portion and the opposite end of the bushing;

a shoulder surface on said bushing extending outwardly beyond said channel at the end of the first portion proximal to the second portion;

guide means in the bushing to guide the presser bar for longitudinal movement relative to the bushing;

a first threaded sleeve at the end of the first portion of the bushing within the head and substantially coaxial with the axis of the first portion;

a helical tension spring, one end of which is screwed onto the first threaded sleeve to be held thereby with the axis of the helical spring substantially coincident with the axis of the first portion of the cylindrical outer surface of the bushing; and

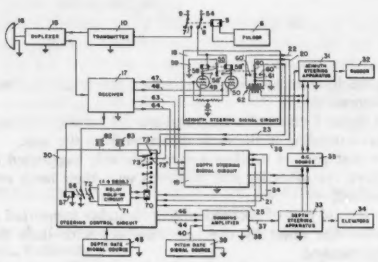
attachment means attached to one end of the presser bar within the head and comprising a second threaded sleeve, the other end of the tension spring being screwed onto the second threaded sleeve to be held thereby with the axis of the second threaded sleeve coincident with the axis of the first threaded sleeve, wherein the tension spring pulls the shoulder surface of the bushing against the head.

4,323,025

TORPEDO STEERING CONTROL SYSTEM

Seth G. Fisher, and Stephen Kowalyshyn, both of Ellicott City, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 7, 1961, Ser. No. 94,095
Int. Cl.³ F42B *19/04*
U.S. Cl. 114—25 **2 Claims**



2. In a propulsive torpedo having depth-steering elevators, in combination, a depth control system comprising means for deriving a first signal having characteristics corresponding to the sense and magnitude of rate of change of torpedo depth, means for deriving a second signal having characteristics corresponding to the sense and magnitude of rate of change of torpedo pitch angle, means for combining only said first and second signals to provide a summation error signal, and depth-steering elevator control apparatus responsive only to said error signal to effect reduction of torpedo pitch angle rate and depth rate to substantially zero values, whereby to maintain said torpedo at substantially constant depth.

4,323,026

DRAG REDUCING STRUCTURE TO MINIMIZE VESSEL COLLISION DAMAGE

John J. Gallagher, 1000 Conn. Ave., NW., #1103, Washington, D.C. 20036

Filed Oct. 24, 1979, Ser. No. 87,738
Int. Cl.³ B63B *59/02*
U.S. Cl. 114—219 **10 Claims**

1. In a sea-going vessel having a drag reducing structure projecting from the forward end thereof generally below the water line, a means to reduce the damage caused by a bow collision of said vessel with other vessels by reducing the capability of said structure to penetrate another vessel and simultaneously absorb at least a portion of the energy of collision comprising:

collapsible walls forming said structure, a substantially flat

structural wall intersecting said collapsible walls to define therewith a fluid-tight enclosure within said structure;

fluid filling said enclosure to support said structure under the normal forces of use; and

valve means communicative with said enclosure to release fluid therefrom and allow sacrificial collapse of said structure to said substantially flat structural wall upon impact of a predetermined magnitude therewith to thereby remove penetrating projections therefrom.

4,323,027

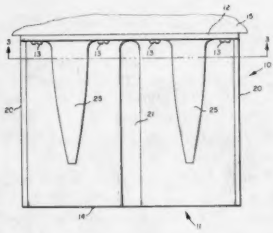
TRIM TAB FOR POWER BOAT

William H. Schermerhorn, R.D. #2, Hammond, N.Y. 13646

Filed Jun. 23, 1980, Ser. No. 162,302

Int. Cl.³ B63B *1/20*

U.S. Cl. 114—285 **8 Claims**



1. A trim tab for mounting to extend aft from a bottom region of a transom of a power boat, said trim tab comprising:

a. a single piece of tough and substantially rigid resin material formed with an approximately uniform thickness to provide an integral mounting plate and lifter;

b. said mounting plate being flat for fitting against said transom;

c. a forward region of said lifter extending straight aft from said mounting plate at about a right angle to said mounting plate;

d. said lifter curving downward in a trailing region aft of said forward region, and said downward curve of said lifter being formed around a transverse axis spaced aft from said mounting plate and said forward region and disposed below said lifter;

e. said forward region of said lifter having raised and spaced apart semitubular surfaces inclined to extend from an upper region of said mounting plate downward to join said downward curve of said trailing region of said lifter;

f. approximately parallel side edges of said lifter running straight aft from said transom being formed to extend downwardly; and

g. said lifter having a downwardly extending ridge running straight aft between said semitubular surfaces and approximately parallel with said side edges.

4,323,028

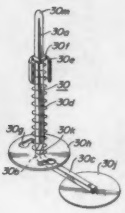
VISUAL INDICATING SYSTEM FOR TALL POLE CARRIER RAISING AND LOWING APPARATUS

John S. Garchinsky, Aldan, Pa., assignor to Union Metal Manufacturing Company, Canton, Ohio

Filed Jan. 28, 1980, Ser. No. 116,037

Int. Cl.³ G01D *11/00*

U.S. Cl. 116—285 **5 Claims**



1. In a system for raising and lowering a carrier for luminaires and the like to and from the top portion of a pole, an assembly for providing a visual indication of the carrier reaching a predetermined position adjacent the top of said pole, said assembly including:

(a) a generally L-shaped member mounted on the carrier for limited axial and pivotal movement, said member having a vertical portion with an upper end and a horizontal portion with an enlarged position-indicating member mounted on an extended end thereof, said indicating member being movable between first and second positions, said first position providing a visual indication that the carrier reached said predetermined position adjacent the top of the pole;

(b) bracket means for mounting the L-shaped member on the carrier, said bracket means having an aperture through which the vertical portion of said L-shaped member projects;

(c) means for biasing the position-indicating member toward the second position; and

(d) the vertical portion of the L-shaped member having a twisted area engageable with the bracket means within the aperture whereby said vertical portion will rotate as it moves axially through the aperture of the bracket means upon the top end of said vertical portion contacting the top portion of the pole to pivot the horizontal portion and the position-indicating member to the first position to provide a visual indication that the carrier has reached the predetermined position.

4,323,029

LABELING MACHINE, ESPECIALLY FOR BOTTLES HAVING A FOUR-WAY TOGGLE MECHANISM AS A DRIVE

Heinz W. Knuppertz, Dusseldorf, and Hans Lederer, Meerbusch, both of Fed. Rep. of Germany, assignors to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,374

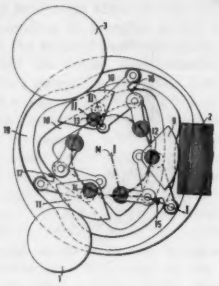
Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821895

Int. Cl.³ B05C *1/02;* B65C *9/16*

U.S. Cl. 118—231 **1 Claim**

1. In a labeling machine for objects having a gluing station, a label-supply station and a label-transfer station consecutively arranged along a path, a rotatable carrier, at least one pickup element rotatably mounted on the carrier such that with each revolution of the carrier it is moved past the stations, each pickup element having an outwardly curved label receiving surface which rolls along the foremost label and along the other stations and a drive for each pickup element comprising a four-way toggle mechanism including a crank, a connecting

rod and a swinging link, the connecting rod being joined to the crank and swinging link at two respective joints, two cam followers connected to the connecting rod by lever arms and which are spaced a fixed distance apart, a curved track cam path for each cam follower to impart to the pickup element a rotary motion with constant direction of rotation the rotary motion being controlled by one of the followers when the



other follower is in a dead position, the improvement wherein the cam followers are disposed outside the joints of the swinging link and connecting rod on the one hand and the connecting rod and crank on the other hand, and the four-way toggle mechanism and the lever arms fixed to the connecting rod of the followers are adjusted to one another such that during a revolution of the carrier the field swept by the swinging link does not encompass the axis of rotation of the carrier.

4,323,030

SPRAY COATING DEVICE

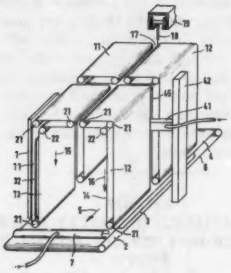
Lehmann, Jr. Ernst, Boppartshofstrasse 35, CH-9014 St. Gall, Switzerland

Filed Jun. 18, 1980, Ser. No. 160,680

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926040

Int. Cl.³ B05L *15/00*

U.S. Cl. 118—309 **30 Claims**



1. A spray coating device for spraying particulate coating material, comprising:

a spray chamber for containing articles to be spray coated; the chamber having a bottom;

a discharge device located at the chamber bottom for discharging from the chamber coating material that has accumulated on the bottom of the chamber;

the chamber being further defined by and being located inside inner walls, the inner walls being movable with respect to the chamber;

means for moving the inner walls for causing the inner walls to move to deliver coating material that has accumulated on the inner walls to the discharge device, and at least some of the inner walls moving downwardly toward the bottom of the chamber; the inner walls comprising endless movable belts having inner courses facing inwardly into the chamber for defining the inner walls and having outer courses that pass outside the respective inner courses; each endless belt being in the form of a loop, and a grounded metal plate being positioned inside the loop of at least one of the endless belts for screening off electric fields; and

a spray device directed to spray coating material inside the chamber for spraying an article therein, the spray device being further directed to spray coating material into the space between those of the inner walls that are moving down toward the chamber bottom.

4,323,031

CRYSTAL PLATING APPARATUS

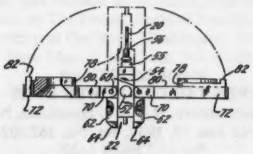
Alan Kaplan, 2 Fairfield Ave., West Caldwell, N.J. 07006

Division of Ser. No. 34,780, Apr. 30, 1979, Pat. No. 4,236,487.

This application Oct. 6, 1980, Ser. No. 194,560

Int. Cl.³ C23C *13/08, 13/12*

U.S. Cl. 118—720 **2 Claims**



1. A crystal holder for plating crystals comprising:

(a) an insulating base;

(b) a pair of receptacle tubes extending upward from said insulating base to receive a pair of leads from the crystal and make electronical contact therewith, and to mount a crystal on said insulating base;

(c) a pair of opposing hinge plates pivotally connected to said insulating base;

(d) a mask holder disposed on each of said hinge plates;

(e) an apertured mask disposed in each hinge plate; and

(f) said opposed hinge plates coacting to bring said apertured masks into operative position with a crystal mounted on said insulating base.

4,323,032

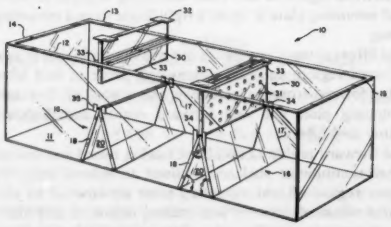
FISH TANK AND AQUARIUM

Leon Halfon, 2146 Fargo St., Los Angeles, Calif. 90039

Filed Jul. 8, 1980, Ser. No. 166,819

Int. Cl.³ A01K *64/00*

U.S. Cl. 119—5 **11 Claims**



1. A substantially rectangularly shaped watertight tank having a longitudinal axis suitable for use as an aquarium or fish tank, comprising:

a bottom portion defined as a substantially flat surface;

four upwardly extending vertical side walls enclosing said bottom portion, each of said side walls being also substantially flat and disposed normally to each other and to said flat tank bottom portion; and

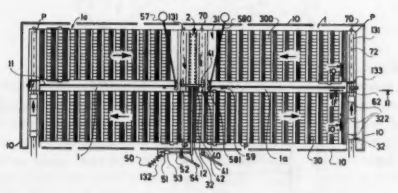
at least one V-shaped brace member formed in the bottom of said tank to open downwardly and extend transversely across said bottom portion of said tank between opposed ones of said vertical side walls substantially normal to the longitudinal axis of said tank, said at least one V-shaped brace member being formed by a pair of planar support members disposed substantially normal to said opposed side walls and joined in a watertight seal along their upper disposed edges and along their lower and end edges, respectively, to said tank bottom portion and opposed tank side walls, said opposed side walls between which said at least one V-shaped brace member extends being each made of a unitary plate of glass of selected uniform thickness and the ends of said at least one V-shaped brace member joined to said opposed side walls and extending from said tank bottom portion upwardly on said opposed side walls to a selected height below said tank's designed water surface level but above the water depth at which water pressure in said tank would otherwise break said opposed glass side walls thereby to surprisingly and significantly increase the water pressure supporting capability of said opposed glass side walls so that thinner, less expensive and lighter glass panes can be utilized.

4,323,033

MOBILE ARRANGEMENT FOR A GROUP STABLING AND HANDLING OF FARM ANIMALS

Josef Vosyka, Cernosice, and Jiri Skoda, Chocen, both of Czechoslovakia, assignors to Vyzkumny ustav zivocisne vyroby Uhrineves, Prague, Czechoslovakia

Filed Feb. 18, 1981, Ser. No. 235,745
Int. Cl.³ A01K *1/12*
U.S. Cl. 119—14.04 **8 Claims**



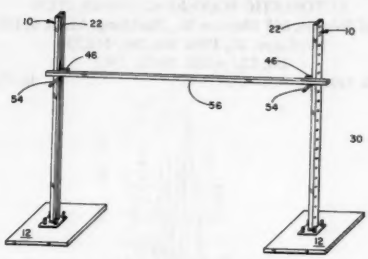
1. A mobile arrangement for the confining stabling and treatment of a plurality of milk producing farm animals, comprising an enclosure with two similar rectangular bays disposed in mirror relationship, each bay having two sets of longitudinally extending rails, the sets of rails of each bay being parallel to and spaced from each other, the two sets of rails extending normal to the imaginary plane separating the two bays from an inner terminus adjacent such plane and an outer terminus removed from such plane, a milking room extending along said plane, a plurality of elongated platforms each having a plurality of confining stalls thereon extending transversely of the length of the platform, means for advancing the platform in each bay transversely of their lengths along a first set of longitudinally extending rails in a direction outwardly away from said plane to the outer terminus of the first set of rails, means for transferring the platforms in the direction of their length from the outer terminus of the first set of rails to the outer terminus of the second set of rails, means for advancing the thus transferred platforms in a direction transversely of their lengths along the second set of rails in the direction inwardly to the inner terminus of the second set of rails, and means for moving the platforms at the inner terminus of the second set of rails in the direction of their lengths to the milking room and thereafter transferring them to the inner terminus of the first set of rails, the platforms retaining the same orientation in space throughout their travel from the first terminus of the first set of rails to their return to said first terminus of the first set of rails.

4,323,034

DOG JUMP APPARATUS

Bertyl W. Carlson, Minneapolis, Minn., assignor to Acme Machine Company, Minneapolis, Minn.

Filed Aug. 18, 1980, Ser. No. 178,770
Int. Cl.³ A01K *15/02*; A63B *5/02*
U.S. Cl. 119—29 **8 Claims**



1. A jump apparatus for the training of dogs, the apparatus comprising:

a pair of channel shaped legs having upper and lower ends;

a pair of base panels;

the upper end of each leg being open and the lower end of each leg being connected to one of the base panels so that the legs are positioned in a generally upright manner; and

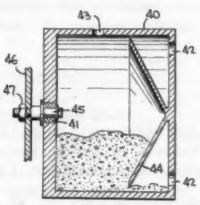
the channel configuration of each of the legs forming a slot facing the other leg and being of a size for selectively accepting and retaining one of a pair of support devices for an unsecured cross bar and for selectively positioning one end of each of a plurality of high jump panels in a generally vertical plane.

4,323,035

SQUIRREL-PROOF BIRD FEEDER

Abraham Piltch, 9618 Dilston Rd., Silver Spring, Md. 20903

Filed Feb. 6, 1980, Ser. No. 119,196
Int. Cl.³ A01K *39/01*
U.S. Cl. 119—51 R **7 Claims**



7. A selective bird feeder comprising:

container means receiving and storing feed material for removal therefrom by birds, said container means including substantially imperforate peripheral wall defining a hollow interior, said peripheral wall surrounding and being radially spaced from a horizontally-extending longitudinal axis of said container means;

support means mounting said container means, with said axis horizontal, for free rotational movement of said peripheral wall about said longitudinal axis in response to application of a rotative force to said peripheral wall;

wherein said peripheral wall includes a sealable filler hole

defined therethrough for admitting bird feed into said hollow interior;

wherein said container means further includes at least one end wall disposed generally perpendicular to said axis, said end wall including at least one access opening defined therethrough and sized to permit birds smaller than a predetermined size to have access to said hollow interior;

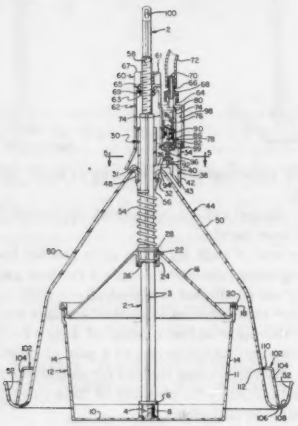
and further comprising baffle means at least partially spaced from said end wall for restricting flow of bird feed toward said access opening from said baffle means to said end wall.

4,323,036

AUTOMATIC WATERING APPARATUS

Michael Salerno, 665 Blossom St., Fitchburg, Mass. 01420

Filed Apr. 22, 1980, Ser. No. 142,734
Int. Cl.³ A01K *39/02, 7/02*
U.S. Cl. 119—81 **10 Claims**



1. An automatic watering apparatus comprising a central post, means for supporting said post, a sleeve slidably but non-rotatably mounted on said post, a valve assembly, means for mounting said valve assembly on said post, a supply tube for connecting said valve assembly to a water source, said sleeve and said valve assembly being engageable to operate said valve assembly, a bell member rotatably mounted on said sleeve and having a channel for collection of water discharged from said valve assembly, and means for biasing said sleeve and bell member in a direction whereby said valve assembly is operated by said sleeve.

4,323,037

FLUIDIZED BED FIRING UNIT

Helmut Meyer-Kahrweg, Wuppertal, Fed. Rep. of Germany, assignor to Steag Aktiengesellschaft, Essen, Fed. Rep. of Germany

PCT No. PCT/DE79/00030, § 371 Date Nov. 18, 1979, § 102(e) Date Nov. 8, 1979, PCT Pub. No. WO79/00794, PCT Pub. Date Oct. 18, 1979
PCT Filed Mar. 19, 1979, Ser. No. 175,207
Int. Cl.³ F23D *19/02*
U.S. Cl. 122—4 D **2 Claims**

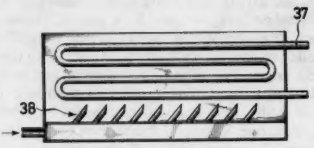
1. A fluidized bed firing unit comprising:

a container having walls and a bottom with a plurality of spaced, generally vertical, pressurized air supply pipes extending therethrough;

a fluidized bed of comparatively inert material maintained in said container by said pressurized air from said supply nozzles;

fuel supply means for supplying a solid carbonaceous fuel in solid granular form to the lower portion of the fluidized bed for combustion;

additional pressurized air supply means extending into said container adjacent the periphery thereof for introducing a horizontal stream of air in said container coacting with the air from said vertical nozzles for causing the fluidized bed to circulate in a continuous horizontal circular path in said



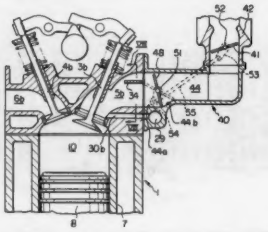
container; and vertically arranged laterally spaced heat exchanger coils in the region of the fluidized bed, wherein the laterally spaced regions of the fluidized bed lying between the coils contain means for introducing off-center air causing horizontal circular path circulation of the fluidized bed within each of the regions of the fluidized bed between the coils.

4,323,038

INTAKE SYSTEM OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Katsuhiko Motosugi; Hiroshi Takahashi; Shuhei Toyoda, and Toshio Tanahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 17, 1979, Ser. No. 40,045
Claims priority, application Japan, Aug. 10, 1978, 53-97603
Int. Cl.³ F02B *29/2*
U.S. Cl. 123—188 M **19 Claims**



1. A multi-cylinder internal combustion engine having a plurality of cylinders, each having a combustion chamber and an intake valve which has a valve head, said engine comprising:

at least one mixture passage common to at least two cylinders and comprising a collecting portion having an inlet, and at least two branch mixture passages branched off from said collecting portion, each of said branch mixture passages having an upper wall and a bottom wall and being connected to said respective combustion chamber via said corresponding intake valve;

fuel supply means arranged in the inlet of said collecting portion;

a common connecting channel;

at least two channel branches each being connected to said common connecting channel and having an opening which opens into one of said respective branch mixture passages;

at least two rotatable throttle valves each being arranged in a respective one of said branch mixture passages at a location upstream of the opening of a corresponding channel branch and having a lower edge and an upper edge,

said upper edge cooperating with the upper wall of said corresponding branch mixture passage to form therebetween a mixture flow passage, the cross sectional area of which is increased as the throttle valve is rotated in accordance with an increase in the level of the load of said engine, the lower edge of each of said throttle valves cooperating with the bottom wall of said corresponding branch mixture passage to prevent flow between the lower edge of said throttle valve and the bottom wall of said corresponding branch mixture passage when said throttle valve is at least partly open; and

a guide plate arranged in each of said branch mixture passages at a position located downstream of and near a corresponding one of said throttle valves in the vicinity of the upper wall of said branch mixture passage.

4,323,039

ANTECHAMBER SYSTEM DIESEL ENGINE

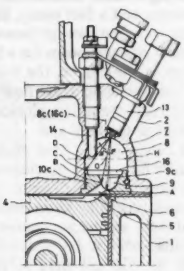
Takanori Tsugekawa; Tosio Banba, and Masakuni Matsui, all of Osaka, Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Jun. 3, 1980, Ser. No. 156,114

Claims priority, application Japan, Jun. 5, 1979, 54-76055[U]

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—275 **8 Claims**



1. In a combustion chamber system Diesel engine including: a combustion chamber formed by a front chamber and a rear chamber inside a cylinder head; a communication port communicating said combustion chamber with a main combustion chamber defined in a piston; and a glow plug mounted in a glow plug insertion hole formed in said cylinder head and a fuel injection nozzle mounted in a nozzle insertion hole in said cylinder head, each positioned in said cylinder head, adjacent said rear chamber; the improvement wherein said combustion chamber includes said rear chamber formed integrally with said cylinder head inside said cylinder head and said front chamber formed on a sleeve member detachably fitted to said cylinder head and facing said rear chamber, wherein the axes of said front chamber and said rear chamber are parallel and offset with respect to each other and wherein the diameter of the portion of said front chamber facing said rear chamber is less than the diameter of the facing portion of the rear chamber.

4,323,040

PROTECTING AN INTERNAL COMBUSTION FUEL INJECTION ENGINE FROM OVERSPEEDING

Roman Blocki, Bielsko-Biala, Poland, assignor to Wytwornia Silnikow Wysokopreznych "PZL-Andrychow", Andrychow, Poland

Filed Dec. 17, 1979, Ser. No. 104,232

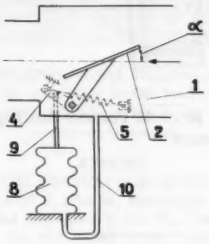
Claims priority, application Poland, Dec. 18, 1978, 211872; Sep. 22, 1979, 218455

Int. Cl.³ F02B *11/08*

U.S. Cl. 123—389 **2 Claims**

1. A device for protecting internal combustion fuel injection engines from overspeeding, wherein said device is arranged in an air supply conduit of an engine, said device comprising a closing member including a flap controlled by air that enters and flows through said supply conduit, and said flap being adapted to close said supply conduit at a predetermined air flow speed corresponding to the maximum permissible engine speed, said flap also being adapted to remain in its open position at speeds lower than the maximum permissible engine speed, and said flap being adapted to revolve about an axis which is disposed perpendicularly to yet spaced from the axis of said supply conduit,

wherein the closing member is said flap fitted on a shaft, said shaft being borne in openings in the walls of said supply conduit, the axis of rotation of said shaft being situated in



a plane perpendicular to the axis of said supply conduit and spaced from the axis of said supply conduit, and on said shaft there is also fitted a lever connected to a tension spring means to maintain said flap in the course of normal operation of the engine at an angle in relation to the axis of said supply conduit, and also to revolve said flap about said axis of said shaft, wherein the direction of the turning moment originated by the force exerted by said spring means on said lever during the initial phase of closing said supply conduit by said flap is opposite to the direction of the turning moment originated by the dynamic air pressure exerted on said flap, and in the final phase of closing of said supply conduit by said flap the directions of both of said turning moments are conformable.

4,323,041

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE OF FUEL INJECTION TYPE

Yoshinori Endo, Hamamatsu, and Masaaki Yoshikawa, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 12, 1979, Ser. No. 57,095

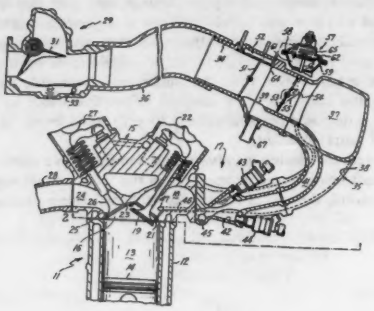
Claims priority, application Japan, Jul. 14, 1978, 53-85222

Int. Cl.³ F02M *32/00*

U.S. Cl. 123—432 **14 Claims**

1. An induction chamber of variable volume in which combustion occurs, a main induction passage terminating in main intake port for delivering a charge to said chamber, and an auxiliary induction passage terminating in an auxiliary intake port for delivering a charge to said chamber, the effective cross sectional area of said auxiliary induction passage being substantially less than that of said main induction passage so that a given mass flow of charge delivered to said chamber through said auxiliary induction passage will enter at a significantly greater velocity than the same charge delivered through said main induction passage, the improvement comprising a charge

forming device for delivering fuel to said chamber only through said auxiliary induction passage, said charge forming



device providing all of the chamber fuel requirements at all speed and load ranges.

4,323,042

FUEL CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

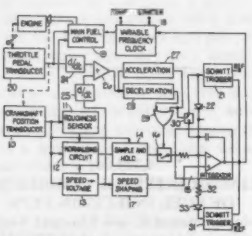
Richard G. Woodhouse, and Malcolm Williams, both of Birmingham, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Feb. 27, 1980, Ser. No. 125,105

Claims priority, application United Kingdom, Mar. 14, 1979, 08993/79

Int. Cl.³ F02B *33/00*; F02M *7/00*; F02P *5/04*

U.S. Cl. 123—436 **4 Claims**



1. An internal combustion engine fuel control system comprising:

roughness sensor means for providing a normalized roughness signal, said roughness signal dependent upon the magnitude of fluctuations in engine speed divided by said engine speed;

speed compensation means, responsive to said engine speed, for providng a speed dependent reference signal;

means for producing a signal representative of a magnitude of difference between said roughness signal and said speed dependent reference signal; and

means, responsive to said representative signal, for adjusting fuel flow to said engine, said fuel flow adjustment proportional to said representative signal.

4,323,043

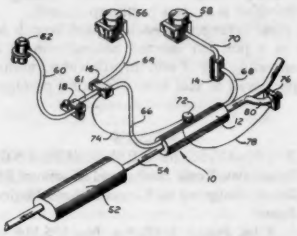
LIQUID FUEL PREHEATING MEANS

John M. Alderson, 21332 Bulkhead Clr., Huntington Beach, Calif. 92646

Division of Ser. No. 960,713, Nov. 14, 1978, abandoned, which is a continuation of Ser. No. 786,636, Apr. 11, 1977, abandoned. This application Feb. 4, 1980, Ser. No. 118,795

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **4 Claims**



1. Liquid fuel preheating means particularly adaptable for use on a gasoline burning internal combustion engine equipped with a regular carburetor and a fuel pump, comprising:

heat exchanger means with first passage means for feed fuel to the engine and second passage means for a hot fluid incident to normal operation of the engine, the two passage means being so oriented that the concurrent flow of feed fuel and said hot fluid respectively therethrough results in heat transfer from the hot fluid to the fuel; and

accessory means for retaining the heat exchanger means in such position that feed fuel to said engine passes through said first passage means prior to carburetion of the fuel, when the engine is running, said accessory means including means for integration of said heat exchanger means into the entire exhaust system so that exhaust gas passes through said second passage means as said hot fluid to heat fuel passing through said first passage means and thereby vaporize the latter;

said heat exchanger means comprising an enclosed cylindrical housing, with an opening in each end for the passage of exhaust gas, and a coil of tubing, said coil being positioned within said housing and being adapted to receive liquid fuel for the engine at one end and discharge vaporized fuel at the other end, said coil being coaxially disposed within said housing;

said coil serving as said first passage means for said feed fuel and the space surrounding the coil within said cylindrical housing serving as said second passage means for said exhaust gas;

said liquid fuel preheating means including an accumulator and means for conducting the vaporized fuel from said heat exchanger means thereinto prior to carburetion of the fuel, said accumulator comprising a vessel for containment of a quantity of the vaporized fuel adapted to satisfy the fuel demands of the engine during operation thereof;

said accumulator being provided with valve and drain means and being adapted to trap nongaseous components of the vaporized fuel, whereby such nongaseous components collect as a sludge in the accumulator that can be periodically removed through said drain means;

said liquid fuel preheating means including a special carburetor adapted to receive vaporized fuel from said accumulator and feed the proper ratio of fuel and air to said engine for proper operation of the latter;

said liquid fuel preheating means also including air inlet means for admitting ambient air into said exhaust system upstream of the position of said heat exchanger means therein; a thermostatically-controlled valve in said air inlet means; a thermostatically-controlled three-way valve adapted to alter-

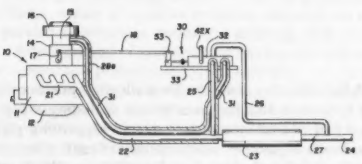
nately admit said liquid fuel to said regular carburetor and to said heat exchanger means, said three-way valve being normally open to fuel flow to said regular carburetor and closed to fuel flow to said heat exchanger means; thermostat control means adapted to sense the temperature within said second passage means in said cylindrical housing of said heat exchanger means and open the three-way valve to fuel flow into said heat exchanger means at a first temperature level and to open said valve in said air inlet means at a second temperature level; whereby upon start-up of the cold engine, fuel first flows to said regular carburetor and continues that flow until said first temperature level is reached within said heat exchanger means whereat the thermostat control means actuates said three-way valve to switch the fuel flow into said heat exchanger means, and when the temperature within said heat exchanger means reaches said second level said thermostat control means opens said valve in said air inlet means to admit air into said exhaust system to cool the exhaust gas therein for improved operation of said engine.

4,323,044

ENGINE FUEL VAPORIZING DEVICE AND SYSTEM

William L. Erwin, 1506 Barbara, Irving, Tex. 75060, and Addison B. Chamness, Jr., 2231 Lovers La., Dallas, Tex. 75235

Filed Aug. 11, 1980, Ser. No. 177,204
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **8 Claims**



1. A fuel charging device for an internal combustion engine having an intake manifold and a fuel-air throttle control at the intake n anifold, said device comprising:

a housing having means defining a vaporizing and mixing chamber, and means for connecting a vaporized fuel conduit to said mixing chamber for conveying fuel to said engine;

said housing having a plurality of fuel flow channels; each of said channels comprising: a fuel liquid inlet passage, a valve chamber communicating with said inlet passage, a feed chamber communicating said valve chamber with said vaporizing chamber, and means for connecting a fuel liquid supply conduit to said fuel liquid inlet passage;

metering valve means disposed in each of said respective valve chambers, each including an actuator stem projecting from said housing;

actuator means connected to said valve stems for controlling the operation of said valve means, adapted for connection to the engine throttle control;

and heat exchange means in said vaporizing chamber, including exhaust gas conduit means for connection to the exhaust system of said engine.

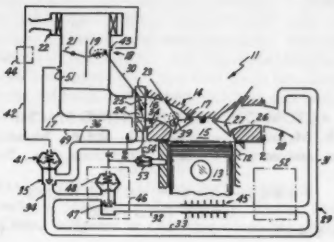
4,323,045

FLOW CONTROL DEVICE FOR EXHAUST GAS RECYCLING SYSTEM

Ryuichi Yamashita, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 30, 1979, Ser. No. 98,867
Claims priority, application Japan, Nov. 30, 1978, 53-148080
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—570 **7 Claims**

1. In an internal combustion engine having a chamber of variable volume in which combustion occurs, an induction system for delivering a charge to said chamber, an exhaust system for exhausting spent exhaust gases from said chamber, and an emission system for recylcing at least a portion of products generated during the operation of said engine and



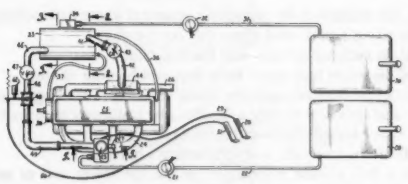
returning said products to said chamber, the improvement comprising means responsive to the load of said engine for cooling said products prior to return to the chamber.

4,323,046

DUAL FUEL SYSTEM FOR AUTOMOBILES

Stanley Barber, 3310 S. 27th St., Fort Smith, Ark. 72901

Filed May 5, 1977, Ser. No. 794,099
Int. Cl.³ F02M *13/06, 31/18*
U.S. Cl. 123—575 **6 Claims**



1. A dual fuel system for an internal combustion engine having an intake manifold, said system comprising:

a first liquid storage tank for containing a petroleum fuel;

first delivery means connected to said first storage tank for supplying liquid fuel therefrom;

a carburetor interconnecting said first delivery means and said intake manifold to measuringly supply a mixture of air and petroleum fuel to said engine;

a second liquid storage tank for containing a non-petroleum fuel;

second delivery means connected to said second storage tank for supplying liquid fuel therefrom;

a vaporization chamber connected to said second delivery means to receive liquid non-petroleum fuel in the bottom thereof, said chamber equipped with level control means regulating the amount of liquid fuel within said chamber to define thereabove a vapor space;

a heating coil disposed within the bottom of said vaporization chamber for warming liquid fuel delivered thereto by said second delivery means to thereby generate non-petroleum fuel vapors;

an air intake port communicating with the vapor space of said chamber to maintain substantially atmospheric pressure within said chamber;

a vapor delivery conduit interconnecting the vapor space of said chamber directly with the intake manifold of the engine;

valve means associated with said vapor delivery conduit to measuringly supply the flow of mixed air and non-petroleum fuel vapors to the intake manifold; and

alternatively selectable, variable actuator means coupled to said carburetor for adjustably regulating the flow of aair

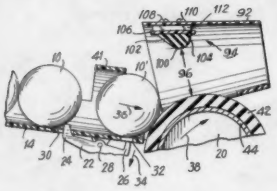
and petroleum fuel mixture to the engine and coupled to said valve means for adjustably regulating the flow of air and non-petroleum fuel vapors to the engine, whereby one of the two fuels may be selected for operation of the engine.

4,323,047

AUTOMATIC BALL PITCHING MACHINE

James K. McIntosh, Somerset, N.J., and M. Numata, Tokyo, Japan, assignors to Carolina Enterprises, Inc., New York, N.Y.

Filed Dec. 12, 1979, Ser. No. 102,651
Int. Cl.³ F41B *15/00*
U.S. Cl. 124—1 **16 Claims**



1. An apparatus for propelling spherical game balls sequentially along a path, said apparatus comprising:

(a) an inclined gravity-feed loading chute;

(b) means to load game balls into said loading chute;

(c) a flywheel adjacent the lower end of said loading chute, said flywheel having a flexible and resiliently deformable outer surface on its circumference;

(d) means to rotate said flywheel at high speed;

(e) a ball release assembly adjacent the lower end of said loading chute, to feed said game balls sequentially to said flywheel;

(f) a guide chute extending downstream of the path and being mounted above said flywheel, said guide chite having an upstream open end and a downstream open end, so that the game balls are passed sequentially by the rotating flywheel through the upstream open end into said guide chute and thereupon through the downstream open end; and

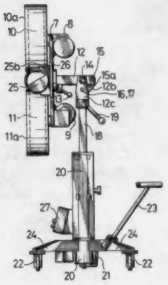
(g) a stationary, flexible and resiliently deformable brake pad mounted in said guide chute between the open ends thereof and above said flywheel, said guide chute extending beyond said brake pad, said brake pad being spaced from said flywheel at a distance less than the diameter of said game balls, so that a constriction in the path of travel of the game balls is provided in the guide chute, and so that each game ball released by said release assembly from said loading chute first engages said rotating flywheel which moves the game ball against said pad, which temporarily holds fast the top of said game ball while the bottom of said game ball remains in contact with the rotating flywheel, which pulls the game ball past the constriction by squeezing the flexible and resiliently deformable pad and flywheel surface, so that once free of the constriction, said flywheel propels the free game ball past said brake pad along said guide chute for a distance sufficient to guide the game ball along a predetermined trajectory, and thereupon said flywheel throws said game ball out of the downstream open end of said guide chute and comcomitantly imparts a backspin on said game ball, the backspin being of an opposite sense of rotation to that of said flywheel.

4,323,048

BALL SHOOTING MACHINE FOR VOLLEYBALL PRACTICE

Retsuo Saito, and Junji Nagase, both of Odawara, Japan, assignors to Kabushiki Kaisha Tokiwa Seisakusho, Japan

Filed Aug. 26, 1980, Ser. No. 181,624
Claims priority, application Japan, Jul. 17, 1980, 55-101167[U]
Int. Cl.³ F41B *3/04*
U.S. Cl. 124—78 **1 Claim**



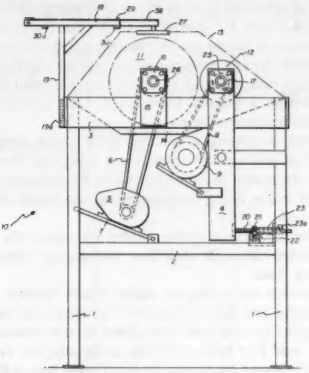
1. A ball shooting machine for volleyball practice comprising: a volleyball shooting mechanism including a supporting plate, a pair of motors attached to said supporting plate, said motors being adjustable independently of each other for varying their operational speeds, and a pair of tire wheels rotatably attached to said supporting plate and opposing each other with a gap therebetween somewhat smaller than the diameter of the ball, said tire wheels being adapted to be rotatively driven by respective ones of said motors; supporting means including an intermediate rod in support of said supporting plate, a pillar supporting said intermediate rod and at least three radially extending legs for supporting said pillar in an upright position; ball shooting angle changing means including a rotatable couple between the center of said supporting plate and one end of said intermediate rod, and locking means provided in said couple to releasably lock said plate in a plurality of rotatable positions; ball course changing means including rotating means at the other end of the rod which is adapted for making said intermediate rod rotatable at an intermediate portion of the latter through substantially 90°, and locking means associated with said rotating means for changing the angle of inclination of said supporting plate between vertical and horizontal positions; ball shooting direction changing means including a rotatable couple connecting the other end of said intermediate rod and the upper end of said pillar and locking means associated with said couple for locking the rod against rotation; hydraulically operable shooting height changing means including a hydraulic cylinder between the lower end of said pillar and said legs and the lower end of said pillar received by said hydraulic cylinder; shooting position changing means including a transportation lever attached to one of said legs and casters attached to said legs; and ball charging means for feeding balls to the wheels, said ball charging means including a cylindrical portion opening to said gap between said two tire wheels from the rear side of the latter and a semi-cylindrical portion integral with said cylindrical portion, said ball charging means being mounted such that the outer surface of said semi-cylindrical portion is inclined at an angle of between 30° and 60° to the supporting plate.

4,323,049

QUARTZ WAFERING MACHINE

Leland T. Sogn, Rte, 1, Box 21F, Mokelumne Hill, Calif. 95245

Filed Oct. 9, 1979, Ser. No. 82,480
Int. Cl.³ B28D *1/04*
U.S. Cl. 125—13 R **7 Claims**



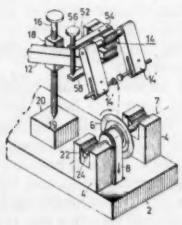
1. In a wafering or sectioning machine comprising, in combination, a frame, a pair of spindles rotatably disposed on said frame in parallel relationship, means for rotating each of said spindles, a wheel on one of said spindles having an outer rim, means for mounting a plurality of crystal bars to be cut on said rim of said wheel in circumferentially spaced relationship, a series of spaced-apart saw blades mounted on the other of said spindles for wafering said crystal bars and means on said frame for pivoting moving said other spindle to advance said saw blades into cutting engagement with said crystal bars during the rotation of said wheel for wafering of said crystal bars during a plurality of revolutions of said wheel and adjustable means to alter the angle of said crystal bars with respect to said saw blades which includes support bars permanently affixed to said rim, transfer bars overlying said support bars having elongate slots along areas of interconnection so that the angular relationship between said transfer an support bars can be altered and then fixed, said transfer bar supports said crystal bar through an intermediate substance.

4,323,050

MACHINE FOR CUTTING PRECIOUS STONES

Joseph Averbuch, 10 Dizengoff St., Tel Aviv, Israel

Filed May 7, 1980, Ser. No. 147,085
Int. Cl.³ B28D *5/00*
U.S. Cl. 125—30 R **6 Claims**



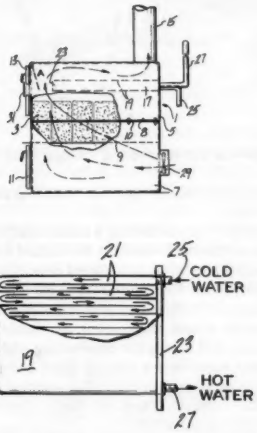
1. A machine particularly useful for sawing diamonds or other precious stones, comprising: a stationary frame; a pair of horizontally spaced posts each having a socket open at its upper end for receiving and rotatably supporting the horizontal trunnions of a vertical sawing disc holder; a swingable arm pivotably mounted at one end to said stationary frame; a workpiece holder removably carried by the opposite end of said swingable arm and rotatable about the longitudinal axis thereof; a threaded pin fixed to said workpiece holder and rotatable therewith about the longitudinal axis of the swingable arm; and a stop member fixed to said swingable arm and engageable by said threaded pin to locate the workpiece holder at a predetermined angular position with respect to the swingable arm and to the vertical sawing disc holder when the workpiece holder is removed from, and then reapplied to, said swingable arm.

4,323,051

COAL-BURNING FURNACE OR BOILER

Les M. Auerbach, Madison, and William F. Ricker, Guilford, both of Conn., assignors to Old King Coal, Ltd., Madison, Conn.

Filed Jul. 8, 1980, Ser. No. 166,775
Int. Cl.³ F24C *1/14*; F24H *9/14*
U.S. Cl. 126—77 **4 Claims**



3. An improved coal-burning furnace comprising:

a. a right parallelspiped firebox consisting of upper and lower firebox halves having mating, outwardly turned flanges joined by mechanical fasteners, with the flanged joint lying substantially along the horizontal median lines of the walls thereof;

b. a grate, in said lower half of said firebox, adapted to support a bed of coal to be burned;

c. first air inlet means, in a first wall of said firebox, for controllably admitting a first stream of air into said firebox below said grate;

d. a heat transfer member, disposed (in said firebox,) above said grate, in said upper half of said firebox, and adapted to collect thereunder combustible gases from the primary combustion of coal on said grate, said heat transfer member comprising a pair of parallel plates, a plurality of parallel channel wall members extending perpendicularly therebetween, and a pair of parallel end walls, said channel wall members being alternately longitudinally offset, each contacting but one of said end walls;

e. second air inlet means in a second wall of said firebox, opposite said first wall, for admitting a second stream of air into said firebox, immediately below said heat exchange member, for burning of said combustible gases collected there; and

f. exhaust means in said upper half of said firebox, above said heat transfer member, adapted to draw the burned gases

over an upper surface of said heat exchange member before the same exit said firebox.

4,323,052

SOLAR ENERGY SYSTEM

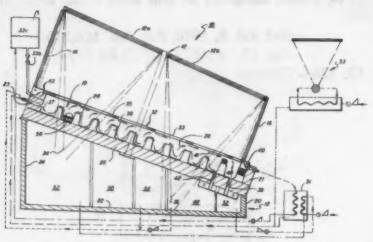
Virgil Stark, 936 Fifth Ave., New York, N.Y. 10021

Continuation-in-part of Ser. No. 1,175, Jan. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 915,001, Jun. 13, 1978, and Ser. No. 920,288, Jun. 29, 1978. This application Jun. 4, 1979, Ser. No. 44,901

The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.

Int. Cl.[3] **F24J** *3/02*; **B01D** *3/02*

U.S. Cl. 126—440 **36 Claims**



1. Apparatus for recovering energy from the sun comprising:

(a) means for conducting a first fluid comprising water to be distilled;

(b) linear lens means having a focal length f, said lens means located a distance less than f from said means for conducting and arranged so as to direct concentrated solar energy on said means for conducting with the focus of said lens means on or below said means for conducting;

(c) conduit means transparent to visible light interposed between said means for conducting and said lens means;

(d) means supplying a second fluid comprising a cooling fluid to said conduit means for assisting the condensation on said conduit means of water evaporated from said means for conducting;

(e) means for collecting the condensed water; and

(f) at least one array of photovoltaic cells disposed in said means for conducting at a location of the concentration of solar energy by said lens means.

2. Apparatus for recovering energy from the sun comprising:

(a) means for conducting a first fluid comprising water to be distilled, said means for conducting comprising an undulated plate system;

(b) linear lens means having a focal length f, said lens means located a distance less than f from said means for conducting and arranged so as to direct concentrated solar energy on said means for conducting with the focus of said lens means on or below said means for conducting, said lens means comprising at least one linear lens aligned so as to direct its energy onto said plate system;

(c) conduit means transparent to visible light interposed between said means for conducting and said lens means, said conduit means comprising a double plate conduit having an upper and a lower plate interposed between said linear lens and said undulated plate system,

(d) means supplying a cooling fluid comprising distilled water to said conduit means for assisting the condensation thereon of water evaporated from said means for conducting; and

(e) means for collecting the condensed water, the first fluid conducted over said means for conducting and said cooling fluid.

5. Apparatus for recovering energy from the sun comprising:

(a) means [illegible]ucting a first fluid comprising water to be distilled, said means for conducting comprising a first transparent tube;

(b) linear lens means having a focal length f, said lens means located a distance less than f from said means for conducting and arranged so as to direct concentrated solar energy on said means for conducting with the focus of said lens means on or below said means for conducting;

(c) conduit means transparent to visible light interposed between said means for conducting and said lens means comprising a second transparent tube surrounding said first transparent tube;

(d) means supplying a cooling fluid comprising distilled water to said second transparent tube, said cooling fluid being circulated between said tubes for assisting condensation of water being evaporated on the inside of said first tube; and

(e) means for collecting the condensed water, the first fluid conducted through said first transparent tube and said cooling fluid.

6. Apparatus according to claim 5 and further including means to cause said lens to track the movement of the sun, said means adapted to rotate said lens about an axis concentric with the axis of said first tube, said lens being adapted to direct its radiation along said tubes with its focal point below the bottom of said tube assembly.

4,323,053

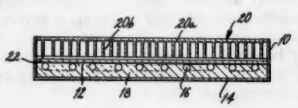
SOLAR HEATER WITH INTEGRAL HEAT TRAP GLAZING

Robert W. McCullough, Tarrytown, and Thomas A. Hewett, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 824,103, Aug. 12, 1977, abandoned. This application Apr. 18, 1980, Ser. No. 141,328

Int. Cl.[3] **F24J** *3/02*

U.S. Cl. 126—441 **13 Claims**



1. In a solar air heater comprising, in combination:

a housing having a light-transmitting front wall for passing incident solar radiation and including an inlet and an outlet for establishing a flow path for a gaseous medium to be heated,

a gas-permeable radiation absorbent collector element positioned across the flow path in said housing and arranged to accept incident solar radiation passing through said front wall and to transfer the absorbed heat to said gaseous medium passing along said flow path and through said collector element, and

a radiation trap disposed in said housing adjacent to the surface of said front wall facing said collector element, said radiation trap comprising a cellular honeycomb structure containing a multiplicity of open cells in communication with said flow path and having cell walls which are substantially perpendicular to said front wall and which serve as baffle elements to inhibit the flow of said gaseous medium through said radiation trap in a direction substantially parallel to the plane of said front wall, said cellular structure being maintained in at least firm mechanical contact with said front wall and being composed of a light-transmitting material which is opaque to infrared radiation emitted from said collector element in a direction toward said front wall; the improvement of integrally

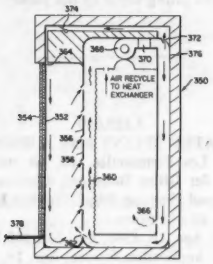
forming said light-transmitting front wall and heat trap as a unitary member thereby eliminating interfacial surfaces, joints or adhesive bonds therebetween which can act as scattering sites for incident light.

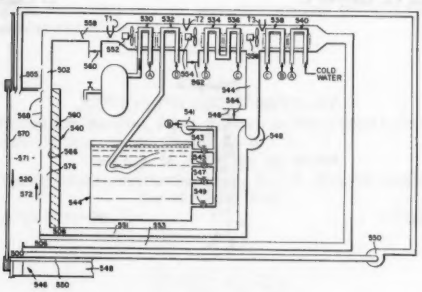
4,323,054

SOLAR ENERGY COLLECTION SYSTEM

Richard L. Hummel, 87 Boulton Dr., Toronto, Ontario, Canada (M4V 2V5)

Continuation-in-part of Ser. No. 761,187, Jan. 21, 1977, Pat. No. 4,126,270. This application Nov. 20, 1978, Ser. No. 962,405
Claims priority, application United Kingdom, Jan. 23, 1976, 2595/76
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—449 **10 Claims**





1. A solar energy collector in which air is the working fluid and which comprises: a solar energy absorbent body having a surface which is exposed to sunlight in use and from which solar energy absorbed by the body can be transmitted as sensible heat; a panel which is transparent to sunlight and which is disposed at the exterior of said body and spaced therefrom so as to define therewith a first air passageway in front of said body; means defining a second air passageway behind said body and having a heated air outlet adjacent an upper end thereof; and an inlet for air to be heated, communicating with said first air passageway;

said panel being spaced from said absorbent body by an amount sufficient to permit the formation of respective hot and cold boundary layers of air on opposed surfaces of said solar energy absorbent body and panel respectively and to allow for a buffer zone between said boundary layers for supressing convective heat transfer from the body;

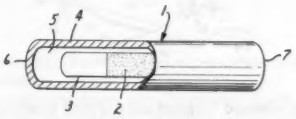
and said body comprising a panel having an outer surface which defines said surface exposed to sunlight and which is coloured a selective dark colour to supress heat loss by radiation, said panel being intended to be disposed at an angle greater than about 80° to the horizontal when the collector is installed and being formed with a plurality of vertically spaced transverse openings defined by respective upper and lower edges, of which the upper edges are spaced outwardly of the lower edges so as to cause transfer from said first air passageway to said second air passageway of boundary layers of heated air formed on said outer surface of the panel in use, whereby said layers of air are not permitted to become large enough or turbulent enough to transfer significant amounts of heat to said buffer zone of substantially stagnant air in use.

4,323,055

RADIOACTIVE IODINE SEED

David O. Kubiatowicz, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 8, 1980, Ser. No. 138,293
Int. Cl.³ A61K *27/04*
U.S. Cl. 128—1.2 **6 Claims**



1. In a radioactive iodine seed comprising a sealed container having an elongate cavity, a therapeutic amount of radioactive iodine within said cavity and a carrier body disposed within said cavity for maintaining said radioactive iodine in a substantially uniform distribution along the length of said cavity, the improvement wherein said carrier body is an elongate rod-like member formed of silver or a silver-coated substrate which is X-ray detectable, said carrier body containing a layer of radioactive iodide formed on the surface of said carrie body, said carrier body occupying substantial portion of the space within said cavity.

4,323,056

RADIO FREQUENCY INDUCED HYPERTHERMIA FOR TUMOR THERAPY

Nicholas F. Borrelli, Elmira; Albert A. Luderer, Corning, and Joseph N. Panzarino, Big Flats, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 19, 1980, Ser. No. 151,210
Int. Cl.³ A61K *9/14, 41/00*
U.S. Cl. 128—1.3 **12 Claims**

1. A method for reducing the mass of a tumor comprising localized magnetically-coupled, RF-induced hyperthermia mediated by a material which is non-toxic to animal tissue and which has incorporated therewithin magnetic iron-containing crystals of such size, composition, concentration, and magnetic properties to impart a coercive force of at least 200 oersteds to said material, and wherein the frequency of said RF magnetic field will not exceed about 10 kilohertz, allowing essentially only magnetic hysteresis heating to occur.

4,323,057

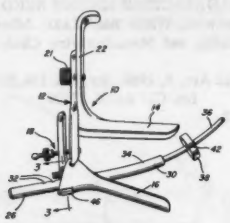
SELF RETAINING UTERINE ELEVATOR

David J. Jamieson, 1908 Coffee Rd., Modesto, Calif. 95355

Filed May 27, 1980, Ser. No. 153,725
Int. Cl.³ A61B *1/32*
U.S. Cl. 128—17 **9 Claims**

1. A speculum for use in inverted position and for manually elevating a female uterus toward the abdominal wall, said speculum including first and second elongated transversely arcuate upper and lower blades opening toward each other and defining a longitudinal open ended housing therebetween, mounting structure connected between the first corresponding

ends of said blades relatively pivotally joining said blades for swinging of the second corresponding ends thereof toward and away from each other and adjustable lateral shifting of the axis of relative pivoting of said blades toward and away from one of said blades, said mounting structure including means operative to adjustably limit swinging of said second ends toward each other, an elongated rod disposed between said blades, extending through said housing and having a first base end cradled in the first end of the other blade, said first end of said rod being longitudinally shiftable relative to the other blade first end, clamp means releasably rigidly anchoring said first



rod end in adjusted longitudinally shifted position relative to said other blade, the second end of said rod being inclined away from the second end of said other blade and toward the second end of said one blade when said blades are generally parallel and a cervix engaging abutment carried by and shiftable along said second end of said rod, and retaining means operative to releasably retain said abutment in adjusted position on said rod, said second end of said one blade having one end of an elongated handle supported therefrom and disposed at generally right angles relative thereto with the other end of said handle projecting substantially directly away from said other blade.

4,323,058

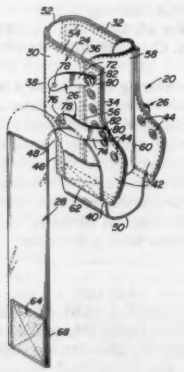
ANKLE BRACE

Garnett E. Detty, 525 General Muhlenberg Rd., King of Prussia, Pa. 19406

Filed Oct. 14, 1980, Ser. No. 196,224

Int. Cl.[3] A61F *3/00*

U.S. Cl. 128—80 H **20 Claims**



1. An ankle brace comprising a jacket, malleoli stabilization means and lift strap means, said jacket having a medial side portion and a lateral side portion, each having a bottom, top, front and rear edge and elastic means connecting said portions together at their rear edges and at their bottom edges, said front edges of said side portions being arranged to be secured together by lacing means, said jacket being arranged to fitable about the ankle and contiguous portions of the foot of a person, with the medial side portion of the jacket located over the medial side of the ankle and with the lateral side portion of the jacket located over the lateral side of the ankle, said malleoli stabilizing means comprising lateral stabilizing means secured to the lateral side portion of said jacket for surrounding the external malleolus and medial stabilizing means secured to the medial side portion of said jacket for surrounding the internal malleolus, said lateral and medial stabilzing means being arranged to be releasably secured together by lacing means, said lift strap means being an elongated member having a pair of ends, each arranged for securement to a respective side portion of said jacket, with the intermediate portion of said strap means being wrapped about the instep and the ankle of the person to provide an upward lifting force to the jacket.

4,323,059

ARTICULATED SPLINT FOR A KNEE JOINT

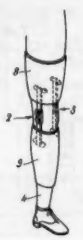
Andre Rambert, Les Fontanelles, 10, bis rue Docteur Bonhomme, Lyon 3e; Gilles Bousquet, Chemin de Marandon, Saint Etienne, and Francois Rigal, Hopital Interdepartemental, Hauteville, all of France

Filed Apr. 16, 1980, Ser. No. 140,704

Claims priority, application France, Apr. 19, 1979, 79 10960; Dec. 26, 1979, 79 32140

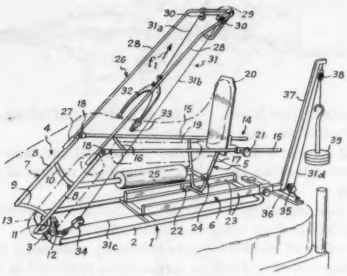
Int. Cl.[3] A61F *3/00*

U.S. Cl. 128—80 C **11 Claims**



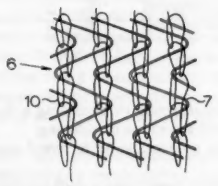
1. An articulated splint for a knee joint of the type having two symmetrical portions which are to be respectively placed on respective sides of a leg of a patient and held in place by upper and lower parts of a cast which has its central part absent to allow movement of a knee of a patient, the splint comprising said two symmetrical portions, each of said symmetrical portions including a first, upper, femoral upright and a second, lower, tibial upright, said first upright and said second upright being intended to be fastened with respective corresponding uprights of the opposite one of said symmetrical portions by the respective upper and lower parts of the cast; a first pin defining an axis of rotation of said rod with respect to one of said uprights and extending through said rod; and a second pin defining a point of movement of said rod with respect to the other of said uprights and extending through said rod, said second pin being positioned in an elongated aperture in the other of said uprights and said elongated aperture having its longitudinal axis oriented in the direction of said first pin, wherein, to limit rotation of said second, tibial upright to a single direction from its position in alignment with said first, femoral upright, said rod of each of said portions exhibits, along its edge opposite that of the direction of rotation of said second, tibial upright, a wing forming a stop for each of said uprights.

4,323,060
SPLINT
Jean-Claude R. Pecheux, 55, Avenue d'Arches, Charleville-Mezieres, France (08000)
Filed Apr. 18, 1980, Ser. No. 141,405
Claims priority, application France, Apr. 23, 1979, 79 11181; Nov. 5, 1979, 79 27622
Int. Cl.³ A24C *5/18*
U.S. Cl. 128—84 R **15 Claims**



1. A splint for a lower limb comprising; a base, an assembly having a femoral support member pivoted to said base, a tibial support member pivoted to said femoral support member and having a portion resting on and movable relative to said base, and drive means extending between said femoral support member and said tibial support member for producing relative angular movement between said members and between said members and said base.

4,323,061
STIFF SUPPORTING BANDAGE
Koji Usukura, Saitama, Japan, assignor to Tokyo Eizai Laboratory Co., Ltd., Tokyo, Japan
Filed Sep. 28, 1979, Ser. No. 80,041
Claims priority, application Japan, Oct. 4, 1978, 53-122339
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—90 **1 Claim**



1. A fabric adapted to be impregnated with a selected, hardenable, stiffening material thereby forming an initially flexible bandage that can be coverted to a light weight, strong, rigid bandage by curing the stiffening material, said fabric comprising:

an amount of a first fiber and an amount of a second fiber combined together,

said first fiber is formed of glass fibers,

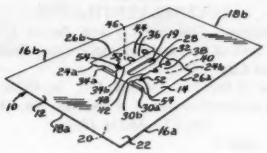
said second fiber is a fiber selected from a class containing cotton, flax, staple fiber, wool, acrylic resin, nylon, rayon and polyester,

said amount of said glass fiber has a weight selected from a range of 20% to 70% of the total weight of said fabric,

said first and second fibers are formed as first and second yarns and are woven together,

said second yarn is a compound yarn formed of said second fiber combined with a third fiber selected from said class.

4,323,062
SURGICAL DRAPE WITH RETAINING DEVICE
Herbert G. Canty, Ingleside, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Nov. 28, 1980, Ser. No. 210,887
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—132 D **22 Claims**

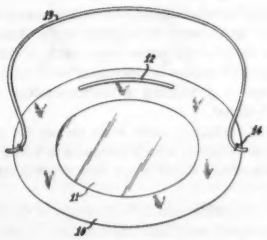


1. A drape for performing a surgical procedure on a patient's body, comprising:

a main sheet for placement over the patient's body, said main sheet having an inner surface facing toward the patient's body after placement of the drape, and an outer surface facing away from the patient's body after placement of the drape; and

a pocket on the outer surface of said main sheet, said pocket being spaced from the site of surgical procedure and being positioned in the expected path of fluid runoff during the surgical procedure, said pocket having a flap defining a pouch and an outer edge defining an opening communicating with said pouch, said flap having an aperture extending through the flap, and an elastic strip extending across the aperture to engage against tubing or the like placed in the flap aperture.

4,323,063
MEDICAL FACE MASK
Jeanne M. Fisichella, 3716 SW. 30th St., Terrace Apt. 41B, Gainesville, Fla. 32608
Filed Apr. 21, 1980, Ser. No. 142,034
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—139 **3 Claims**



1. A medical face mask comprising a head strap and mask to fit over the nose, mouth, and chin of the wearer and to conform at its edges reasonably closely to the face and neck of the wearer, the central portion of said mask adjacent the nose and mouth of the wearer being transparent to provide a view therethrough of the mouth of the wearer and being air-impermeable to inhibit air, moisture and bacteria from passing therethrough, and the remaining annular portion surrounding said central portion of said mask being made of air-permeable, bacteria-filtering material to permit breathing by the wearer said annular portion being connected to and along and termi-

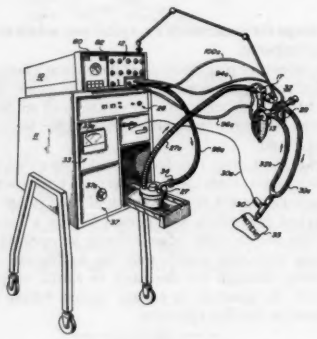
nating adjacent to the outer edge portions of said central portion.

4,323,064

VOLUME VENTILATOR

Richard J. Hoenig, Coopersburg, and James J. Klinikowski, Whitehall, both of Pa., assignors to Puritan-Bennett Corporation, Kansas City, Mo.

Continuation of Ser. No. 735,369, Oct. 26, 1976, abandoned.
This application Jun. 1, 1979, Ser. No. 44,635
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—204.21 44 Claims



1. A ventilator system having patient connection means and a plurality of integrated modes of operation for providing a patient with a flow of breathing gas under pressure comprising

valve means for controlling said flow of gas to said patient connection means for inspiration and expiration,

mode selecting means for operating said ventilator system in at least one selected mode of operation;

adjustable setting means including a plurality of adjustable time setting means individually related to sigh inspiratory time, sigh expiratory time, inspiratory time, expiratory time and inspiratory pause time each corresponding to said integrated modes of operation with each of said time setting means producing a corresponding time related threshold signal,

signal means including time base means for producing a common time signal which increases in value with time at a predetermined linear slope for a predetermined time duration,

means for comparing and determining the crossing of each threshold signal with said common time signal for producing a plurality of control signals,

means responsive to said mode selecting means for selecting at least one control signal corresponding to a selected integrated mode and for resetting the time base means to begin a new time signal thereby to provide said predetermined time duration, and

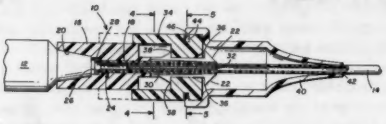
means for applying said at least one selected control signal to said valve means for controlling the flow of gas to said patient connection means whereby each of said time setting means may be continuously adjusted to change one or more of said threshold signals without varying any of the other threshold signals.

4,323,065

ATTACHABLE CONNECTOR FOR CATHETER

John E. Kling, Dallas, Tex., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 17, 1980, Ser. No. 113,099
Int. Cl.[3] A61M *5/00*
U.S. Cl. 128—214 R 7 Claims



1. A connector for attachment to a section of tubing, such as a catheter or the like, comprising:

a hub having a distal end and a proximal end, and an axial bore extending therethrough sized for receipt of the tubing;

said hub including a tapered chamber at the proximal end thereof in fluid communication with the bore;

a plurality of resilient fingers extending outwardly from the distal end of said hub in surrounding relationship with the bore;

a slidable ring mounted for movement along said fingers from an unlocked position to a locked position wherein the connector and the tubing are secured together in fluid communication; and

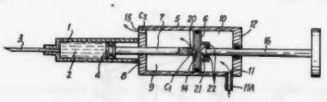
said fingers each including a pair of oppositely facing barbs for retaining said ring in the locked position to prevent disconnection of the connector from the tubing.

4,323,066

SYRINGE

Frederic Bourdon, 51, Aristide Briand St., 92300 Levallois, France

Filed Sep. 24, 1980, Ser. No. 190,259
Claims priority, application France, Nov. 6, 1979, 79 27275
Int. Cl.[3] A61M *5/00*
U.S. Cl. 128—218 R 19 Claims



1. Apparatus for injecting or aspirating a fluid, including a liquid or paste, said apparatus comprising:

(a) a first piston adapted to be in direct contact with said fluid;

(b) a second piston comprising a shaft adapted to coact with said first piston, said second piston being slideably mounted in a cylinder, said cylinder being divided by said second piston into a first chamber situated on the fluid injection side of said cylinder and a second chamber situated on the opposite side of said cylinder, the cylinder being adapted to be in fluid communication with a positive or negative pressure;

(c) at least one communication channel positioned between said second chamber and the exterior of said cylinder, said at least one communication channel having a chamber orifice opening into the second chamber and an exterior orifice opening to the exterior; and

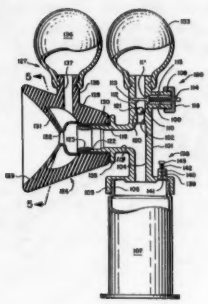
(d) blocking means for blocking said channel;

whereby a positive or negative pressure in said second chamber relative to said first chamber while said communication channel is blocked results in the controllable movement of said first piston.

4,323,067
COMBINATION BREAST PUMP AND GAVAGE FEEDING APPARATUS AND METHOD

Frank H. Adams, 1246 Indiana Ave., Salt Lake City, Utah 84104

Continuation-in-part of Ser. No. 807,773, Jun. 20, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,552
Int. Cl.[3] A61M *1/06*
U.S. Cl. 128—281 24 Claims

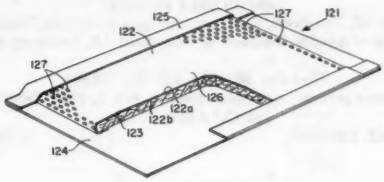


1. A combination breast pump and gavage feeding apparatus comprising:
a conduit;
a suction means connected to the conduit and operable to impose a negative pressure in the conduit;
a housing interconnected in fluid communication with the conduit, the housing being dimensionally configurated to engage a nipple in sealing relationship;
a removable insert means for the housing, the insert means selectively altering the effective internal diameter of the housing, the insert means being configurated as a cylinder fabricated from a resilient material to accommodate sealing engagement between the housing and the nipple, the outside diameter of the insert means corresponding to the inside diameter of the housing and the inside diameter of the insert means being preselected to correspond to the outside diameter of the nipple thereby providing an improved sealing relationship between the nipple and the housing;
means to gently squeeze and manipulate the base of the nipple and surrounding aerola during application of negative pressure to the nipple comprising a pulse unit including a shell having a large concave opening adapted to receive a breast and connecting to a tubular opening adapted to be fixed to and to open into the housing; resilient means in the shell adapted to encircle and to engage the base of the nipple comprising a resilient, breast-engaging membrane and means for sequentially inflating and deflating the resilient, breast-engaging membrane, the resilient means further comprising inwardly projecting, pointed fingers forming backing members spaced around the resilient, breast-engaging membrane; and means for causing said resilient means to squeeze and manipulate the base of the nipple and the surrounding aerola to stimulate lactation;
a coupling means attached to the conduit in fluid communication therewith; and
reservoir means removably coupled to the coupling means.

4,323,068
DIAPER WITH EMBOSSED TEXTILE SHEET

Mohammed I. Aziz, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 927,186, Jul. 24, 1978, abandoned. This application Feb. 25, 1980, Ser. No. 124,411
Int. Cl.[3] A41B *13/02*
U.S. Cl. 128—287 5 Claims

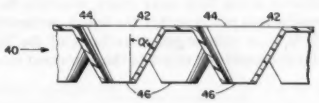


1. A disposable diaper comprising:
means for absorbing moisture;
a liquid impervious backsheet adjacent said means for absorbing moisture; and
a topsheet adjacent said means for absorbing moisture oppositely disposed from said backsheet, said topsheet comprising a porous coherent nonwoven thermoplastic sheet with improved high loads caliper wherein said topsheet is a generally planar sheet having disposed thereon a multiplicity of elevated bosses having side walls and a land wherein said land and said side walls have a thickness no greater than the thickness of the unembossed sheet, said side walls define embossed side wall angles of less than 28 degrees to the perpendicular of said planar sheet.

4,323,069
DISPOSABLE ABSORBENT ARTICLE HAVING AN INTERMEDIATE LAYER INTERPOSED BETWEEN THE TOPSHEET AND THE ABSORBENT CORE

Nicholas A. Ahr, Cincinnati, Ohio, and Douglas J. Smith, Woodbury, Minn., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 12, 1980, Ser. No. 148,660
Int. Cl.[3] A41B *13/02*
U.S. Cl. 128—287 10 Claims



1. A disposable absorbent article comprising:
an absorbent core means for absorbing liquid, said absorbent core means having a first and a second opposed face;
a liquid impermeable backsheet overlaying said first opposed face of said absorbent core means;
a liquid permeable topsheet overlaying said second opposed face of said absorbent core means, said topsheet having an inner surface facing toward said absorbent core means;
a layer of fibers affixed to said inner surface of said topsheet, said layer of fibers comprising a multiplicity of individual fibers, said layer of fibers weighing at least about 1.5 grams of said fibers per square meter of said topsheet; and
an intermediate layer interposed between said layer of fibers and said absorbent core means, said intermediate layer having a multiplicity of tapered capillaries, each of said capillaries having a base opening in the plane of said intermediate layer and an apex opening remote from said plane of said intermediate layer, and having an angle of

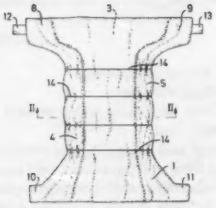
taper of from about 10° to about 60°, said base opening dimension being from about 0.006 to about 0.250 inches and said apex opening dimension being from about 0.004 inches to about 0.100 inches, said base opening being in contact with said layer of fibers and said apex opening being in contact with said absorbent core means.

4,323,070

DISPOSABLE DIAPER

Ingela M. Ternström, Göteborg, and Lars E. Boman, Mölndal, both of Sweden, assignors to Molnlycke AB, Goteborg, Sweden

Filed Jan. 30, 1980, Ser. No. 116,808
Claims priority, application Sweden, Feb. 2, 1979, 7900938
Int. Cl.³ A41B *13/02*
U.S. Cl. 128—287 **3 Claims**



1. In a disposable diaper comprising a first outer layer of a liquid-permeable material and intended to abut the user's body, a second outer layer of a liquid-impermeable material and an intermediate layer of absorbent material arranged between said two outer layers; the improvement in which at least that portion of the diaper situated in the user's crotch is provided with elastic band or thread means extending between the two side edges of the diaper, said band or thread means being at least partially connected with pretension to the liquid-permeable layer and arranged prestressed on the liquid-permeable layer in order to preform said portion of the diaper to a bowl-like shape, whereby in use the marginal regions of the diaper in said crotch portion are forced against the user's body and thereby prevent lateral leakage, the parts of the two outer layers situated in the user's crotch extending transversely a distance beyond the absorbent intermediate layer and being mutually connected only on both sides of said intermediate layer within longitudinal areas along their outer edges, whereby the elastic band or thread means pull together the liquid-permeable outer layer which in turn pulls together sections of the liquidimpermeable layer around the edges of the absorbent intermediate layer.

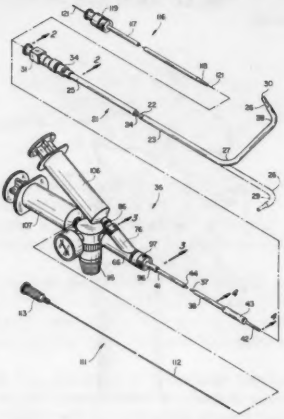
4,323,071

VASCULAR GUIDING CATHETER ASSEMBLY AND VASCULAR DILATING CATHETER ASSEMBLY AND A COMBINATION THEREOF AND METHODS OF MAKING THE SAME

John B. Simpson, Menlo Park, and Edward W. Robert, Los Altos, both of Calif., assignors to Advanced Catheter Systems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 123,713, Feb. 21, 1984, abandoned, which is a continuation of Ser. No. 899,061, Apr. 24, 1978, abandoned. This application May 19, 1980, Ser. No. 151,175
Int. Cl.³ A61M *29/00, 25/00*
U.S. Cl. 128—343 **21 Claims**

1. In a combination of a guiding catheter assembly and a dilating catheter assembly, the guiding catheter assembly comprising a first flexible tubular member formed of a material which has a low coefficient of friction, a second flexible tubular member encasing said first tubular member so that the first tubular member fits tightly in the second tubular member, said combined first and second tubular members having proximal and distal ends and a fitting mounted on the proximal ends, the dilating catheter assembly comprising a flexible tubular member, said tubular member of said dilating catheter assembly having proximal and distal ends and an inflatable annular portion formed integral with the tubular member of said dilating catheter assembly near the distal end thereof, a fitting mounted on the proximal end of the tubular member of the dilating catheter assembly, said dilating catheter assembly being disposed within said guiding catheter assembly and means for inflating and deflating said inflatable annular portion.

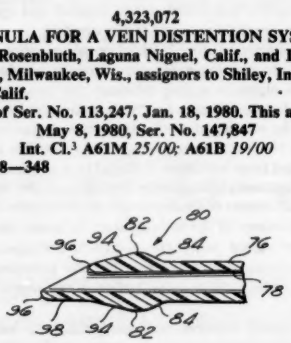


4,323,072

CANNULA FOR A VEIN DISTENTION SYSTEM

Robert F. Rosenbluth, Laguna Niguel, Calif., and Lawrence I. Bonchek, Milwaukee, Wis., assignors to Shiley, Incorporated, Irvine, Calif.

Division of Ser. No. 113,247, Jan. 18, 1980. This application May 8, 1980, Ser. No. 147,847
Int. Cl.³ A61M *25/00*; A61B *19/00*
U.S. Cl. 128—348 **1 Claim**



1. A cannula for use in testing a saphenous vein as a coronary or peripheral bypass graft, said cannula comprising:

a conduit for communicating fluid to said vein; and

a flat, elongate tip on the distal end of said conduit comprising:

a distal beveled portion having generally rounded edges;

a non-tapered section on the side of said tip opposite said beveled portion, said beveled portion and said non-tapered section providing means for forming a generally arcuate leading edge on said tip for facilitating insertion of said tip into said vein and preventing damage to vein tissue;

a tapered portion having a taper of about 7 to 15 degrees located proximally with respect to said beveled portion, said tapered portion forming a ridge to provide means for retaining said cannula within said vein; and

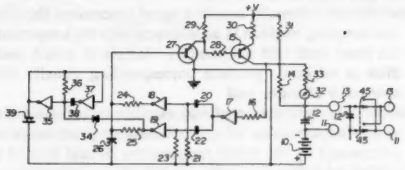
a shoulder having a taper of about 20 to 30 degrees located proximally with respect to and tapered in an opposite direction as said tapered portion to provide means for facilitating a sealing ligature around said vein.

4,323,073

APPARATUS AND METHOD FOR CONTROLLING THE APPLICATION OF THERAPEUTIC DIRECT CURRENT TO LIVING TISSUE

Harold Ferris, St. Eugene, Canada, assignor to COS Electronics Corporation, Lyn, Canada

Filed Aug. 21, 1979, Ser. No. 68,431
Claims priority, application Canada, Sep. 11, 1978, 311015
Int. Cl.³ A61N 1/20
U.S. Cl. 128—419 R **23 Claims**



1. Apparatus for controlling the application of therapeutic direct current to living tissue comprising:

(a) means for increasing the amplitude of an applied direct current passing through the tissue from an insignificant level to a first predetermined higher level at a first controlled rate,

(b) means for changing the current level passing through the tissue to a second predetermined lower level and maintaining it for a predetermined controlled time period following attainment of the first predetermined current level, and

(c) means for decreasing the current level passing through the tissue to an insignificant level at a second controlled rate following the controlled time period,

the current levels being such as to generate voltage gradients in the tissue which are less than nerve stimulation voltage gradients.

4,323,074

PACEMAKER PROGRAMMING APPARATUS UTILIZING A COMPUTER SYSTEM WITH SIMPLIFIED DATA INPUT

George E. Nelms, Edina, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 12, 1979, Ser. No. 19,599
Int. Cl.³ A01N 1/36
U.S. Cl. 128—419 PG **6 Claims**

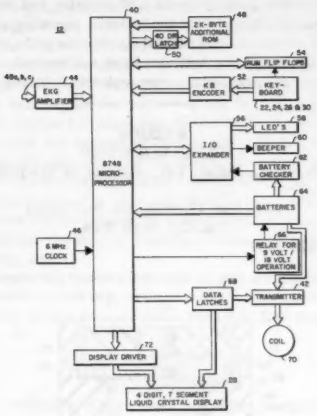
1. Apparatus for programming a pacemaker, said programming apparatus comprising:

(a) keyboard means for receiving and entering by operator manipulation manifestations controlling the operation of the pacemaker;

(b) transmitter means responsive to the manifestations entered via said keyboard means for encoding and transmitting corresponding signals to the pacemaker;

(c) means to be coupled to the patient's body for sensing the stimulating pulses applied by the pacemaker to the patient's heart; and

(d) processor means for executing a program to process data input via said keyboard means and including an interrupt input coupled to receive the sensed pacemaker's stimulating pulses from said sensing means, said processor means responsive to the operation of said transmitter means to enable its interrupt input to receive the sensed stimulating pulses for a period selected to tend to eliminate extraneous signals, and comprising means for detecting and calculating in response to the sensed pacemaker's stimulating pulses the rate and pulse widths of the stimulating pulses.

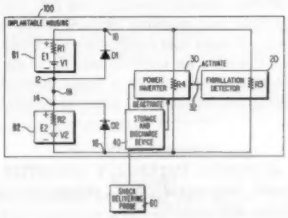


4,323,075

BATTERY FAILURE COMPENSATION FOR A POWER SUPPLY USED IN AN IMPLANTABLE DEFIBRILLATOR

Alois A. Langer, Pittsburgh, Pa., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Jul. 2, 1979, Ser. No. 53,733
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 D **15 Claims**



1. A fully implantable power supply for use in a fully implantable defibrillator having an implantable housing, a fibrillation detector for detecting fibrillation of the heart of a recipient, an energy storage and discharge device for storing and releasing defibrillation energy into the heart of the recipient and an inverter for charging the energy storage and discharge device in response to detection of fibrillation by the fibrillation detector, the inverter requiring a first level of power to be operational and the fibrillation detector requiring a second level of power different from said first level of power to be operational, said power supply comprising:

implantable battery means positioned within said implantable housing, said battery means including a plurality of batteries arranged in series, each of said batteries having a pair of output terminals, each of said batteries producing a distinctly multilevel voltage across its pair of output terminals, said voltage being at a first level when the battery is fully charged and dropping to a second level at some point during the discharge of the battery; and

implantable circuit means positioned within said implantable housing, said circuit means for creating a first conductive

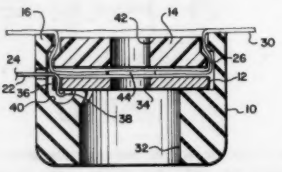
path betwen said serially-connected batteries and said fibrillation detector to provide said fibrillation detector with said second level of power, and for creating a second conductive path between said inverter and said battery means by placing only the batteries operating at said first level voltage in said second conductive path, and excluding the remaining batteries from said second conductive path to provide said inverter with said first level of power.

4,323,076

ELECTRODE CAP

Marvin W. Sams, Dallas, Tex., assignor to Electro-Cap, Inc., Dallas, Tex.

Filed Sep. 12, 1979, Ser. No. 72,611
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—644 **8 Claims**



1. A biomedical electrode system comprising:

a fabric holder adapted for positioning at least one electrode assembly in contact with a patient's body; and

an electrode assembly including:

a bushing having an aperture passing from first to second ends of said bushing;

a conductive electrode positioned within said bushing aperture intermediate said first and second ends;

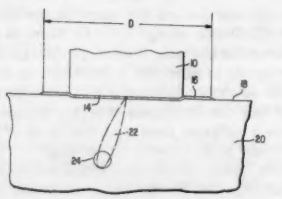
a retaining element carried in said bushing aperture at said first end, said bushing having means at said first end for providing a snap fit of said retaining element within said bushing aperture for retaining said conductive electrode within said bushing aperture and for securing said electrode assembly to said fabric holder with a layer of fabric positioned between said retaining element and said conductive electrode.

4,323,077

ACOUSTIC INTENSITY MONITOR

Lowell S. Smith, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 12, 1980, Ser. No. 129,689
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **13 Claims**



1. A method monitoring the acoustic intensity of energy applied to a body by an ultrasonic probe, comprising the steps of:

positioning a coupling medium between mutually facing, external surfaces of said body and said probe adapted to enhance acoustic coupling between said surfaces, said coupling medium incorporating therein a thermally sensitive agent adapted to provide an indication corresponding to the temperature to which said medium is subjected;

stabilizing said coupling medium to the initial temperature of said body surface;

placing said probe surface substantially in contact with a limited area of said body surface while said coupling medium is positioned therebetween;

radiating ultrasonic energy to said body by means of said probe, said radiated energy being adapted to dissipate heat on said limited area of said body surface; and

adjusting the acoustic intensity of said radiated energy when said temperature indication falls outside a predetermined range;

whereby the acoustic intensity of the ultrasonic energy applied to said body is monitored through the effect on said thermally sensitive agent produced by the heat dissipated on said limited body surface area;

wherein said thermally sensitive agent determines the color of said coupling medium in accordance with the temperature of the latter such that temperature changes to which said medium is subjected produce corresponding visually observable color changes; and

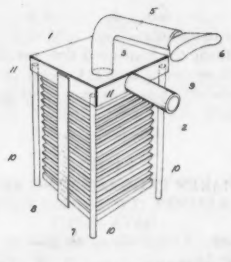
wherein the stabilization of said medium includes the step of stabilizing the color of said medium to a reference color determined by the initial temperature of said limited body surface area.

4,323,078

COLLAPSIBLE RESPIRATORY EXERCISER

Henry J. Heimlich, 17 Elmhurst Pl., Cincinnati, Ohio 45208

Filed Aug. 14, 1980, Ser. No. 177,988
Int. Cl.³ A61B *5/08*; A63B *23/00*
U.S. Cl. 128—728 **6 Claims**



1. A collapsible respiratory exercising device consisting essentially of:

an upper plate having an orifice extending therethrough;

an inhalation tube detachably connected to said orifice;

a flexible tubular bellows attached to and suspended from said upper plate, said plate closing the upper end of said bellows with said opening in communication with said bellows;

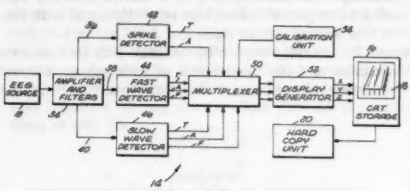
a lower plate attached to and closing the lowermost end of said bellows, said lower plate having sufficient mass to fully expand said bellows and constituting the sole means for expanding said bellows; and

a flexible tape suspended from said upper plate externally of said bellows, said tape having calibrated indicia thereon for measuring the extent to which said bellows has been contracted upon inhalation by a user, and attachment means on said tape engagable with said lower plate, whereby said tape may be wrapped around and secured to said lower plate to restrain said bellows in a contracted position.

4,323,079
APERIODIC ANALYSIS SYSTEM, AS FOR THE ELECTROENCEPHALOGRAM

Mihai C. Demetrescu, Irvine, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 973,423, Dec. 26, 1978, Pat. No. 4,215,697.
This application Dec. 26, 1979, Ser. No. 107,204
The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—731 **7 Claims**



1. A system for recognizing and analyzing waves of an electroencephalogram manifest as an electrical signal comprising:

means adapted to receive said electrical signal for detecting peaks therein of either polarity;

means for storing the amplitude of at least one of said detected peaks of each polarity;

means for sensing a first time period lapsing between a largest peak of one polarity and a first subsequent peak of an opposite polarity;

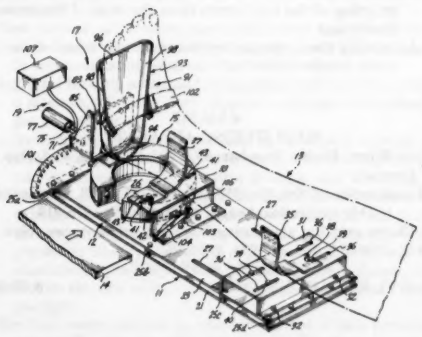
means for sensing a second time period lapsing between said first subsequent peak and the following largest peak of said one polarity; and

means for additively combining said first and second time periods to provide a wave period signal indicative of the period of a wave recognized between successive largest peaks of the same polarity separated by at least one peak of opposed polarity.

4,323,080
ANKLE STRESS MACHINE

Albert H. Melhart, 1007 S. 296th Pl., Federal Way, Wash. 98003

Filed Jun. 23, 1980, Ser. No. 161,915
Int. Cl.³ A61B *6/00*
U.S. Cl. 128—774 **16 Claims**



1. An ankle stress machine comprising:

a planar base;

calf restraining means mounted on said base for supporting a calf spaced from said planar base and restraining movement thereof in one direction in a predetermined plane;

a turntable, said turntable including a large cylindrical bearing mounted on said planar base so as to lie proximal to the ankle, when a calf is supported by said calf restraining means, said large cylindrical bearing having an axis of rotation lying orthogonal to said predetermined plane;

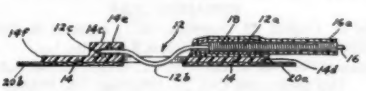
a foot support and stress assembly mounted on said turntable, said foot support and stress assembly including a foot cup positioned to receive a foot attached to a calf supported by said calf restraining means, said foot cup including a heel region for receiving the heel of said foot, a planar region for receiving the bottom of said foot and side walls for impinging on the sides of said foot, said planar and said side walls extending from said heel to the end of the metatarsal bones of said foot, said foot support and stress assembly also including an arm connected to said foot cup for rotating said turntable and, thus, said foot cup about the axis of rotation of said large cylindrical bearing; and,

stress measuring means connected to said arm for measuring the stress on said arm when said arm is stressed during the rotation of said turntable and, thus, said foot cup.

4,323,081
PACING LEAD

Wendy A. Wiebusch, White Bear Lake, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 30, 1980, Ser. No. 164,421
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—785 **12 Claims**



1. A body implantable lead comprising:

a conductor having a distal end;

an insulating sheath having a distal end fixedly attached to and covering said conductor;

an electrode having proximal and distal ends and having said proximal end fixedly attached to said distal end of said conductor; and

electrode support means fixedly attached to said distal end of said insulating sheath for disengaging attachment to said distal end of said electrode.

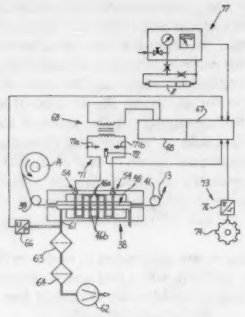
4,323,082
APPARATUS FOR MAKING HOLES IN WEBS OF WRAPPING MATERIAL FOR CIGARETTES OR THE LIKE

Adolf Helms, Hamburg, and Heinz-Christen Lorenzen, Wentorf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Aug. 19, 1980, Ser. No. 179,422
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934045
Int. Cl.³ A24C *5/60*
U.S. Cl. 131—281 **13 Claims**

1. Apparatus for making holes in a running web of wrapping material in a machine for the manufacture and/or processing of cigarettes or other rod-shaped articles which constitute or form part of smokers' products, comprising a housing defining a passage for the running web; means for transporting the web through said housing; first and second electrode means installed in said housing and defining at least one spark gap forming part of said passage so that the running web advances through said gap; means for applying high voltage impulses to said electrode means and for thereby inducing the flow of a current across said gap with attendant generation of sparks which burn holes in the running web and cause the development of dust and ozone; means for drawing a stream of atmo-

spheric air through said passage whereby the stream cools the electrode means and removes dust and ozone from said passage, including conduit means having an intake end communi-



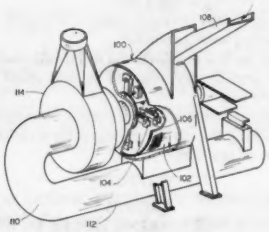
cating with said passage and a discharge end and suction generating means connected to said discharge end; dust intercepting means installed in said conduit means; and ozone separating means installed in said conduit means.

4,323,083

METHOD FOR SEPARATING VEINS FROM LAMINA OF TOBACCO LEAF

Philip H. Cogbill, II, Pineville, N.C., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 47,424, Jun. 11, 1979, Pat. No. 4,248,253.
This application Oct. 27, 1980, Ser. No. 200,848
Int. Cl.[3] A24B *3/02*
U.S. Cl. 131—305 **11 Claims**



1. A process for removing the veins from bulk strip tobacco, including lamina and veins, comprising the steps of: hammermilling said bulk strip tobacco through a discharge screen having openings therein from 5/16 to $\frac{1}{4}$ inch; and, separating the veins from the lamina.

4,323,084

METHOD AND APPARATUS FOR TOBACCO LEAF DESTEMMING

Carl B. Jenkins, Jr.; Harry S. Porenski, Jr., both of Louisville, Ky., and Paul N. Turner, Kettering, Ohio, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 899,768, Apr. 24, 1978, Pat. No. 4,237,909.
This application Nov. 17, 1980, Ser. No. 207,314
Int. Cl.[3] A24B *5/06*
U.S. Cl. 131—319 **13 Claims**

1. A continuous process for destemming tobacco leaves, which comprises:

(a) providing destemming apparatus which comprises;

a first pair of rotatable rollers, each of said rollers being disposed in a face-to-face relationship with the other of said rollers so that a nip is formed between said rollers;

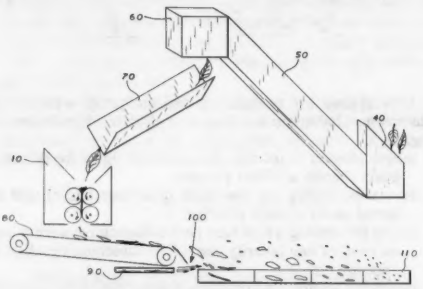
a second pair of rotatable rollers, each of said rollers of said second pair being disposed in a face-to-face relationship with the other of said rollers so that a nip is formed between said second pair of rollers;

said rollers being faced with an elastomeric, gripping material;

means of adjusting the nip between the rollers of each pair of rotatable rollers;

means for mounting the first pair of rollers in tandem relationship with said second pair of rollers whereby the nip of said first pair of rollers is in axial alignment with the nip of said second pair of rollers;

means for rotating one roller of each pair in a clockwise direction and the other roller of each pair in a counterclockwise direction, said directions being such that a leaf



introduced into the nip of said first pair of rollers will be carried to the nip of said second pair of rollers and upon entry into the nip of said second pair of rollers from said first pair will be carried away from said first pair of rollers; and

means for controlling the speed of rotation of said rollers so that the speed of said second pair is faster than the speed of said first pair;

(b) providing tobacco leaves;

(c) causing the rollers of said apparatus to rotate as decribed above;

(d) feeding said tobacco leaves to the nip of said first pair of rollers whereby they are engaged by said first pair and the stem is yanked by said second pair of rollers causing a stripping of the leaf lamina from the stem of the tobacco leaves; and

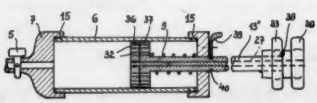
(e) sorting the separated laminae from the stems of the tobacco leaves.

4,323,085

HAIR DYEING APPARATUS

Fritz Röhm, Rechte Brandstr. 49, 8900 Augsburg, Fed. Rep. of Germany

Continuation of Ser. No. 955,183, Oct. 27, 1978, abandoned.
This application Aug. 6, 1980, Ser. No. 175,919
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1977, 2749074; Jun. 3, 1978, 2824525
Int. Cl.[2] A45D *24/22*
U.S. Cl. 132—113 **8 Claims**



1. In a hair-treating apparatus utilizing a treatment liquid

which is a mixture of a plurality of components, comprising a cylindrical container, a piston with a rod carrying a piston head in said container biased toward one end of the latter and locking means engageable with said piston for holding said piston head in a retracted position remote from said one end to enable introduction of treatment liquid through said one end into said container, said one end being closable by an attachment forming a tube with lateral apertures communicating with the interior of said container whereby said treatment liquid can be discharged through said apertures by the advancing piston head under the biasing force thereof upon a release of said locking means,

the combination therewith of a perforated agitator disc received in said container between said one end thereof and said piston head, said disc being provided with a stem passing axially through a bore in said rod and terminating outside said container in a manipulating knob for axially reciprocating said disc and intermixing the components of said liquid by forcing same to flow through the perforations of said disc.

4,323,086

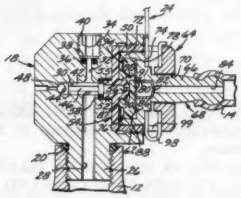
PRESSURE RESPONSIVE FLOW CONTROL APPARATUS FOR BREATHING SYSTEM

Donald R. Gneiding, Fullerton, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 11, 1980, Ser. No. 129,369

Int. Cl.³ F16K *31/14*

U.S. Cl. 137—495 **6 Claims**



1. Pressure responsive flow control apparatus for connection between a source of emergency breathing gas and a hood adapted to fit about a wearer's head for receiving the breathing gas at a controlled flow for inhalation and for receiving the exhalations of the wearer, said flow control apparatus comprising:

a valve body having a first chamber adapted to receive breathing gas from said source to develop a source pressure;

flow control valve means mounted to said valve body and including a valve portion defining a primary flow passage in communication with said first chamber;

a control housing mounted to said valve body and including a secondary flow passage adapted to discharge breathing gas to said hood;

a pressure regulating valve located adjacent said valve portion of said flow control valve means and defining a second chamber with said control housing, and including a through passage providing communication between said primary flow passage and said second chamber, said pressure regulating valve tending to move toward said valve portion in closer proximity to said primary flow passage in response to pressure in said second chamber thereby to reduce the rate of flow of gas through said primary flow passage;

first bias means tending to resist movement of said pressure regulating valve into said closer proximity to said primary flow passage; said valve portion of said flow control means tending to move toward said pressure regulating valve in response to said source pressure in said first chamber thereby to reduce the rate of flow of gas through said primary flow passage, said flow control means including second bias means tending to resist movement of said valve portion of said flow control means toward said pressure regulating valve whereby said flow control valve means effects an increase in the rate of flow of gas through said primary flow passage in substantially inverse proportion to a decrease in said source pressure thereby to compensate for increased concentration of carbon dioxide in said hood resulting from cumulative said exhalations;

a retainer mounted to said valve body and receiving said control housing for movement toward and away from said pressure regulating valve, said retainer and control housing including complemental faces movable away from and toward each other in correspondence to said movement of said control housing toward and away from said pressure regulating valve, respectively; and

a release element receivable in said retainer in wedging relationship between said complemental faces and forcing said pressure regulating valve firmly against said primary flow passage to block the passage of gas therethrough.

4,323,087

CONTROL VALVE

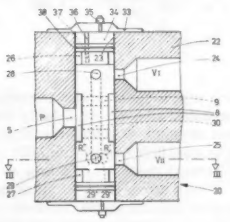
Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Heilmeier & Weinlein, Fabrik fur Oel-Hydraulik GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,480

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2904034

Int. Cl.³ F15B *13/04*

U.S. Cl. 137—625.68 **8 Claims**



1. A control valve for a pressure medium system, particularly a high pressure hydraulic system, with a housing through which a valve hole passes, and with a piston slide-valve displaceable from a neutral position into two control positions, with an intake opening to the valve hole connected with a pump connection, with at least one consuming device connection staggered in the longitudinal direction of the hole relative to the intake opening, and with a return flow connection associated with the consuming device connection, connected with a return flow channel, there being provided in the piston slide-valve in front of the intake opening a pocket extending in the longitudinal direction to guide the flow, which pocket, in the first control position, connects the intake opening with the consuming device connection, provision being made on the piston slide-valve for at least one sealing disc section which, in the first control position, seals off the return flow connection from the consuming device connection, and which in the second control position releases a passage from the consuming device connection to the return flow connection, characterised in that the consuming device connection (**6**;**24**,**25**; V) and the return flow connection (**7**, R) are disposed along the same radial plane relative to the valve hole (**3**, **23**)—though staggered at an angle relative to each other, in that in the piston slide-valve (**4**, **21**) a channel (**10**, **15**, **26**, **27**) is provided, extending in a radial plane and bridging at least the angular staggering between the consuming device connection and the return flow connection, said piston slide-valve channel being located in the neutral position (N) of the valve a distance from the consuming device connection and return flow connection which corre-

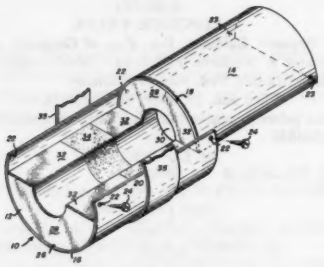
sponds to the valve stroke from the neutral position (N) to the second control position (B), in that the sealing disc section (11) on the piston slide-valve extends in its neutral position between the return flow connection and the consuming device connection, in that the piston slide-valve (21) is secured in the valve hole against rotation and further characterized in that the consuming device connection (6) and the return flow connection (7) are staggered relative to each other by 90°, whilst the inlet or supply (5) lies in a common plane with the consumer device connection, which plane is perpendicular to the plane of the return flow connection (7).

4,323,088

INSULATING PIPE SUPPORT

William F. McClellan, San Jose, Calif., assignor to Pipe Shields, Inc., San Jose, Calif.

Filed Nov. 20, 1979, Ser. No. 95,980
Int. Cl.³ F16L *3/12, 59/08*
U.S. Cl. 138—106 **5 Claims**



1. An insulating pipe support device comprising a first insulating support member adapted to slidably engage a second insulating support member so as to form therewith a cylindrical solid having an axial hole therethrough for receiving a pipe, each insulating support member including an exterior frame and a plurality of insulating inserts abutting each other along the common longitudinal axis of the members, at least one, but fewer than all, of said insulating inserts being constructed of a strong compression resistant material; and

means for engaging the first member with the second member coaxially with a pipe such that the pipe is enclosed between the first and second members and is insulated and supported thereby, the means for slidably engaging the members including a pair of arcuate extensions to said frame of the first member extending with said frame to complete an arc of a circle of greater than 180° such that the second member may be slidably inserted from the end of the first member such that said extensions hold the second member tightly to the first member and restrict relative movement of the members except for sliding movement along the axis thereof.

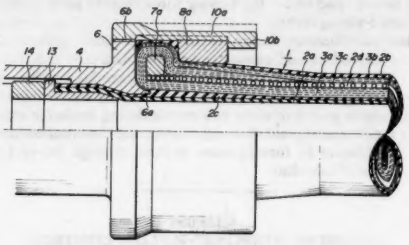
4,323,089

HOSE END CONSTRUCTION

Mamoru Kadono, and Tetsuji Saigusa, both of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,347
Claims priority, application Japan, Oct. 31, 1978, 53-133160
Int. Cl.³ F16L *11/12, 9/00*; F32B *31/00*
U.S. Cl. 138—109 **3 Claims**

1. In a hose end construction comprising a hose main body and a connection metal fitting secured to the end portion of said hose main body, the improvement comprising a hose main body composed of a resilient rubber portion including an inner surface rubber, an annular bead located near the end surface of said hose main body and embedded in said resilient rubber portion and a reinforcing cord layer having an end portion wound around said annular bead to form a turn-back portion and embedded in said resilient rubber portion, a nipple constituting said connection metal fitting and provided at its outer periphery with a rib, the end surface of the end portion of said hose main body being urged against said rib while said turn-back portion being located inside an inner end of said nipple with respect to the axial direction of said hose main body and said inner surface rubber being extended along the inner peripheral surface of said nipple, and a clamping member composed of a clamping ring for circumferentially tightening that portion of the outer surface of said hose main body which is nearer to the center portion thereof than said annular bead to said nipple, and a ferrule having one end threadedly engaged with the outer periphery of said rib and another end forming a reduced diameter portion and slidably engaged with said clamping ring.

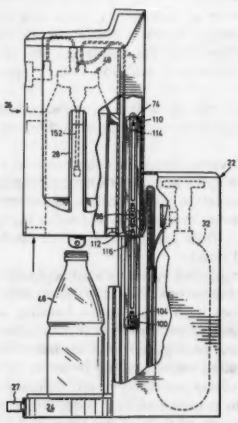


4,323,090

APPARATUS FOR AERATING LIQUIDS

Hugo Magi, Unionville, Canada, assignor to Bronardi Inc., Markham, Canada

Filed May 19, 1980, Ser. No. 151,528
Int. Cl.³ B65B *55/00*; C02D *1/00*
U.S. Cl. 141—70 **18 Claims**



1. Structure for aerating a potable liquid in a container such as a bottle and the like, the structure comprising:

a rear portion;

a movable front portion;

traveller means coupling the front portion to the rear portion for vertical movement of the front portion between a lowered position for accommodating the container in the structure during aeration, and an elevated position provid-

ing access into the structure to place the container in the structure before aeration and to remove the container after aeration;

a connector assembly coupled to the front portion for engaging the container and operable by pneumatic pressure to seal the container during aeration;

tubing means for conveying carbon dioxide from a pressurized source to the connector assembly; and

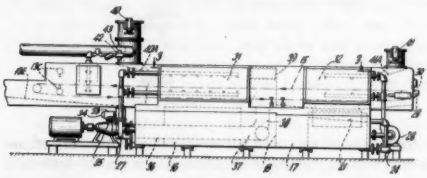
a controller coupled to the tubing means between the pressurized source and the connector means for selectively either directing pressurized carbon dioxide to the connector means with the container in place in the structure to thereby activate the connector assembly to seal the container and to contemporaneously aerate the liquid, or exhausting pressure build up in the connector means and container to permit removal of the container with the aerated liquid.

4,323,091

PAN WASH ENERGY

Robert K. Nolte, Chatham; Robert E. Rath, Morristown, and Michael F. Jarvis, Berkeley Heights, all of N.J., assignors to Metalwash Machinery Corp., Elizabeth, N.J.

Filed May 27, 1980, Ser. No. 153,513
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—60 **6 Claims**



1. In an article washer having a pair of coacting reservoir tanks disposed in side-by-side relationship, means for filling said tanks with a liquid, a spray chamber disposed above each of said tanks, and means for conveying the articles to be washed successively through each of said spray chambers, means for passing high temperature gases through only one of said tanks to heat the liquid contents therein, means for transferring only a limited portion of said gas heated liquid contents to the other tank, means individual to each spray chamber for passing the heated liquid contents from its respective reservoir tank into its respective spray chamber, and means for routing said high-temperature gases from one tank upwardly from said reservoir tank to the spray chambers above both of said tanks, and means adjacent the second spray chamber and distant from the first spray chamber for venting at least a portion of said gases out of said washer.

4,323,092

APPARATUS AND PROCESS FOR DETECTING FREE CHLORINE

Bernd G. Zabel, Rottweil, Fed. Rep. of Germany, assignor to Corvinus & Roth GmbH, Altenstadt, Fed. Rep. of Germany

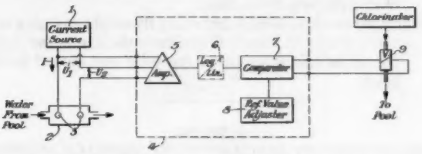
Filed Sep. 19, 1980, Ser. No. 188,607
Int. Cl.³ G05D *11/08*
U.S. Cl. 137—5 **6 Claims**

4. A process for measuring and monitoring the free chlorine content of an aqueous solution comprising:

(a) providing a direct current source to at least two electrodes housed in a sample sell, at least one electrode being of the composition, comprising an alloy of gold and a metal selected from the group consisting of nickel, copper or iron, wherein gold is contained in an amount of about 90% to about 97% by weight and said nickel, copper or iron is contained in an amount of about 10% to about 3% by weight,

(b) flushing said electrodes in said cell with a sample of said aqueous solution,

(c) amplifying the output signal from said electrodes, this signal being proportional to the free chlorine content of said aqueous solution;



(d) comparing said amplified signal to an adjustable reference signal, the difference in value of the measured signal and reference value being proportional to the free chlorine content of said aqueous system,

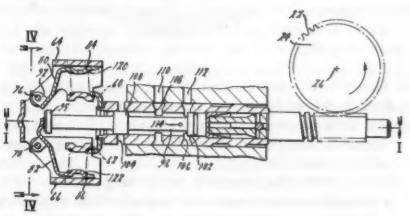
(e) utilizing said difference to regulate a valve adjusting the flow of additional chlorine to said aqueous solution.

4,323,093

MULTIPLE STAGE FLUID PRESSURE GOVERNOR HAVING TWO BREAK POINTS

Douglas A. Whitney, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 23, 1980, Ser. No. 189,992
Int. Cl.³ G05D *13/38*
U.S. Cl. 137—56 **4 Claims**



1. A triple stage fluid pressure governor comprising:

a governor body, a valve opening in said body, a supply pressure passage and a governor pressure passage in said body in communication with said valve opening;

a governor valve sleeve in said valve opening, said sleeve having a pressure supply port, a governor pressure port and an exhaust opening;

means for driving said sleeve rotatably in said valve opening;

a governor valve spool slidably disposed in said sleeve and having spaced valve lands that register with said supply pressure passage and said exhaust opening whereby said lands provide controlled communication between said governor pressure passage and said supply port and exhaust opening to establish a governor pressure in said governor pressure passage, a pressure area on said valve spool being in communication with said governor pressure port whereby a feedback pressure force acts on said valve spool in one direction;

a first set and a second set of primary and secondary flyweights pivotally mounted on said valve sleeve for movement away from said valve spool, each secondary flyweight having a lever portion extending toward said valve spool and adapted to transmit a valve actuating force thereto that opposes said pressure force;

first spring means having a first spring rate for holding the primary and secondary flyweights of said first set in engagement for pivotal movement in unison at speeds less

than a first break-point speed, and second spring means having a second spring rate that is higher than said first spring rate for holding the primary and secondary flyweights of said second set in engagement for pivotal movement in unison at speeds less than a second break-point;

and stop means for limiting the extent of outward movement of said primary flyweights;

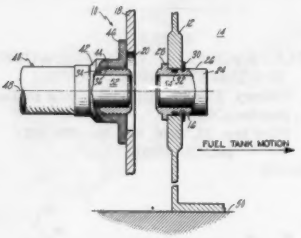
the lever portions of each secondary flyweight engaging said valve spool and transferring a force thereon in the direction of its axis at speeds in excess of said second break-point.

4,323,094

CRASHWORTHY AIRCRAFT FUEL STORAGE SYSTEM

George J. Paulis, Trumbull, and Joseph D. DeCarlo, Bridgeport, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 14, 1980, Ser. No. 207,555
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **2 Claims**



1. Crashworthy aircraft fuel storage system comprising:

a fixed bulkhead having an aperture therein;

a fuel tank adapted to abut said bulkhead during normal operation and having a fuel inlet port therein in register with said bulkhead aperture;

a fuel shut-off valve assembly comprising:

a frangible sleeve member having a first end connected to the fuel tank inlet port and extending therefrom through said bulkhead aperture with clearance therebetween and having a second end with threads thereon located on the opposite side of said bulkhead from said fuel tank, and further having a circumferential groove therein positioned between said threads and said first end to provide a weak section in said sleeve member to induce sleeve member fracture therearound in response to sleeve member tension loading beyond design limits, and

automatic sealing means positioned within said sleeve member and operable to permit fluid flow through said valve when said sleeve member is intact and to prevent fluid flow through both ends of said sleeve member when separated following sleeve member fracture,

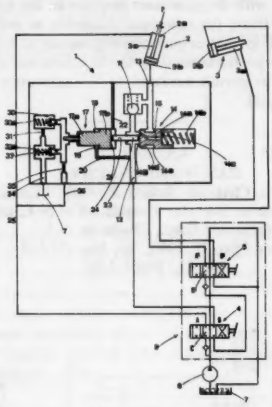
a flexible hose member having an end fitting threadably engaging said frangible sleeve member threads and having a circumferential end flange extending therefrom in spaced relationship to said bulkhead so that said fuel tank, valve and hose member so assembled are in free floating relationship to the bulkhead except for said fuel tank-to-bulkhead abutments and said end flange sized so that it cannot pass through said bulkhead aperture, so that under crash load conditions said fuel tank will move away from said bulkhead and cause said fitting end flange to forceably impact said bulkhead thereby causing said frangible sleeve member to fracture and said automatic sealing means to seal off both ends of the sleeve member so fractured.

4,323,095

BALANCED VALVE WITH UNIDIRECTIONAL OLEO-DYNAMIC UNLOCKING, IN PARTICULAR TO ALLOW A NUMBER OF HYDRAULIC ACTUATORS TO BE SERIES CONTROLLED AT HIGH PRESSURE

Leo Acerbi, Modena, Italy, assignor to Oil Control S.r.l., Modena, Italy

Filed Jul. 8, 1980, Ser. No. 166,829
Claims priority, application Italy, Jul. 11, 1979, 40086 A/79
Int. Cl.³ F15B *13/01*
U.S. Cl. 137—87 **6 Claims**



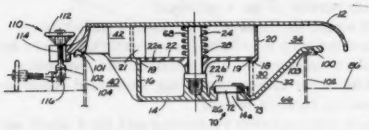
1. An improved balanced valve with unidirectional hydraulic unlocking, in particular to allow a number of hydraulic actuators to be series controlled at high pressure, of the type comprising: a check valve (**11**) actuated by the pressure of the fluid entering from a first orifice (**12**) and exiting from a second orifice (**13**); and a unidirectional valve (**14**) with hydraulic unlocking that operates in the opposite flow direction of the fluid to that of the said first valve, said unidirectional valve (**14**) comprising closing mechanism (**14*a***) which is subjected, in the closing direction, to the elastic thrust of a first pre-loaded spring (**14*b***); and in both directions, to the pressure existing in the said first orifice (**12**) and, in the opening direction, to the pressure existing in the said second orifice (**13**) which is operative only on a first surface of a pre-established area with which the said closing mechanism is provided, the said closing mechanism being thrust, on the opening direction, by the front part of a pilot piston (**17**) driven by the pressure in a delivery pipe (**25**) of the fluid exerting an effect on the rear part of the said piston (**17**); various features of the valve being such that the said pilot piston is subjected, on a second surface of a pre-established area, to the pressure existing in the said first orifice which determines, on the said pilot piston, a thrust that acts in the opening direction of the closing mechanism, the front part of the said piston being connected to atmospheric pressure and exerting on effect on the closing mechanism of the said second valve through the interposition of a stem (**23**); and means for regulating and limiting the pressure, interposed between the said delivery pipe (**25**) and the said pilot piston (**17**) including means (**30**) to supply to the said piston (**17**) a control pressure that is identical to the pressure in the delivery pipe (**25**) up to a minimum pre-established delivery pressure value, including means (**31**), (**31*a***), (**33**) to provide a variable pressure, in accordance with a pre-established law of proportionalities, from the said minimum value to a maximum pre-established delivery pressure valve, and including means (**32**) to provide an approximately constant delivery pressure for values greater than the said maximum value.

4,323,096

COMBINATION VACUUM RELIEF VALVE AND PRESSURE RELIEF VALVE WHICH ARE PROTECTED FROM THE ATMOSPHERE

Richard H. Dugge, St. Louis, and Dallas W. Rollins, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed May 16, 1980, Ser. No. 150,469
Int. Cl.³ F16K 17/26
U.S. Cl. 137—350 10 Claims



1. A combination vacuum relief valve and pressure relief valve assembly comprising:

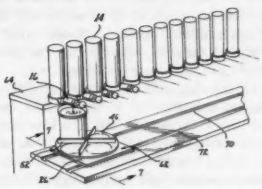
a top cover plate closing an opening in a container to the atmosphere; a bottom plate located below said top cover plate; a vacuum relief valve mounted horizontally and spaced below said top cover plate and above said bottom plate; means biasing said vacuum relief valve into closed position engaging a vacuum relief valve seat located below said top cover plate and below said vacuum relief valve and having a vacuum relief valve opening therein; said vacuum relief valve in said closed position closing communication between the inside of the container and the outside atmosphere, and in open position allowing communication between the container and the outside atmosphere; a plurality of first passageways providing fluid communication between the lower surface of said vacuum relief valve and the outside atmosphere; a plurality of second passageways spaced from said first passageways providing fluid communication between the inside of the container and the upper surface of said vacuum relief valve when said valve is in closed position; said first and second passageways being located below said top cover plate; the cross sectional area of said first passageways throughout their length being at least substantially equal to the cross sectional area of said vacuum relief valve opening and the cross sectional area of said second passageways through their length being at least substantially equal to the cross sectional area of said vacuum relief valve opening; whereby when the pressure inside the container becomes less than atmospheric pressure, atmospheric pressure will cause said vacuum relief valve to move upwardly away from its seat and allow air to enter the container and whereby when the pressure in the atmosphere and in the tank are substantially equalized, said vacuum relief valve will return to the seated position; and whereby for a given available valve cross sectional area the volume of air flow into the container from the atmosphere is maximized for a given pressure drop from the atmosphere into the container; a pressure relief valve opening provided in said bottom cover plate between the interior of the tank and said first passageways; a pressure relief valve seat surrounding said opening; a pressure relief valve mounted for movement between open and closed positions relative to said pressure relief valve seat; the cross sectional area of said pressure relief valve being substantially less than the cross sectional area of said vacuum relief valve; whereby in open position pressure from said tank is vented through said first passageways; said pressure relief valve being protected from the atmosphere by said top cover plate.

4,323,097

TURNTABLE FOR COLORANT DISPENSERS

John J. Achen, 1901 5th Ave., Yuma, Ariz. 85364

Division of Ser. No. 25,185, Mar. 29, 1979, Pat. No. 4,258,759. This application Nov. 6, 1980, Ser. No. 204,500
Int. Cl.³ B65B 43/60
U.S. Cl. 141—168 4 Claims



1. A platform for locating each paint container of a set of paint containers in sequential operating relationship with a colorant discharge unit of a colorant dispenser, said platform comprising in combination:

(a) a tray for supporting the set of paint containers;

(b) divider means mounted on said tray for defining a plurality of radially expanding delineations upon said tray and for accommodating any sized circular paint container within a predetermined size range, said divider means including means for channeling and guiding the paint containers into a predetermined position on placement of the paint containers thereon, said channeling and guiding means including means for restraining tipping of the paint containers and spilling of the contained paint;

(c) a base locatable beneath at least one of the discharge units of the colorant dispenser said base including means for rectilinearly translating said tray to rectilinearly reposition the set of paint containers as a unit from one discharge unit to another;

(d) means for rotatably supporting said tray on said base to position each of the paint containers in sequence beneath each selected one of the discharge units;

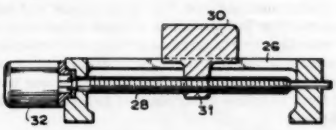
whereby, each selected colorant is dispensed sequentially into all of the containers of the set of containers to enhance uniformity of color of the paint in the set of containers.

4,323,098

METHOD FOR CONTROLLING POSITION OF A PLURALITY OF MACHINING SHAFTS EACH INCLUDING A MACHINE TOOL FITTED THERETO

Yukitomo Suzuki, 19861-83, Shijimizuka-cho, and Masakazu Honda, 123-1, Aoi-cho, both of Hamamatsu-shi, Shizuoka-ken, Japan

Division of Ser. No. 960,605, Nov. 14, 1978, Pat. No. 4,257,103. This application Nov. 1, 1979, Ser. No. 90,105
Claims priority, application Japan, Nov. 16, 1977, 52/137717; Jan. 26, 1978, 53/7906; Apr. 18, 1978, 53/45622
Int. Cl.³ B31B 1/20; B27C 9/00
U.S. Cl. 144—2 R 4 Claims



1. A method of controlling the position of a plurality of machine shafts for a wood working machine, each shaft including a machine tool fitted thereto and supported by a movable block engaged with a screw threaded rotary shaft driven by a servomotor and movable in the axial direction of the screw threaded shaft when the screw threaded shaft is rotated to

thereby control the position of the machine shaft supported by the movable block, comprising:

a first step of rotating said screw threaded rotary shaft at a first rotation speed through a first distance which is larger than backlash between said screw threaded rotary shaft and said movable block so as to move said movable block and machine shaft in the backward direction;

a second step of rotating said screw threaded rotary shaft at a second rotation speed so as to move said machine shaft up to an intermediate position spaced apart from a final position of said machine shaft in the backward direction and located near said final position;

a third step of rotating said screw threaded rotary shaft at a third rotation speed so as to move said movable block along said screw threaded shaft at a low speed from said intermediate position to said final position, said third rotation speed being lower than the second rotation speed of said screw threaded shaft, and being sufficient to prevent occurrence of overshoot of said movable block beyond said screw shaft; and

the amount of rotation of said screw threaded shaft in said first step being equal to that of said screw threaded shaft in said third step.

4,323,099

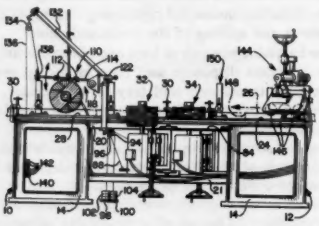
WOOD FINISHING MACHINE

Benjamin S. Bost, Box 321, Conover, N.C. 28613

Filed Mar. 21, 1980, Ser. No. 132,455

Int. Cl.³ B27M *3/00*; B27C *9/04*

U.S. Cl. 144—3 R **7 Claims**



5. A wood finishing machine, comprising:

a frame structure;

a stationary table secured to said frame structure and having an upper horizontal surface for supporting a workpiece thereon;

a first means for finishing a workpiece, including:

a first finishing wheel disposed for rotation about a vertical axis adjacent a side portion of a workpiece,

a first drive means supporting said first wheel and for causing rotation thereof,

a first member supporting said first wheel and first drive means and pivotally mounted to said frame structure for swinging movement about a vertical axis so that said first wheel can move toward and away from said side portion of a workpiece,

means interconnecting said first drive means and said first frame member for providing vertical adjustment of said first wheel relative to said side portion of a workpiece, and

means engaging said first frame member for biasing said first wheel against said side portion of a workpiece with constant force to follow the contour of said side portion of the workpiece;

a second means for finishing a workpiece, including:

a second finishing wheel disposed for rotation about a vertical axis adjacent an opposite side portion of a workpiece from that of said first finishing means,

a second drive means supporting said second wheel and for causing rotation thereof,

a second frame member supporting said second wheel and second drive means and pivotally mounted to said frame structure for swinging movement about a vertical axis so that said second wheel can move toward and away from said opposite side portion of a workpiece,

means interconnecting said second drive means and said second frame member for providing vertical adjustment of said second wheel relative to said opposite side portion of a workpiece, and

means engaging said second frame member for biasing said second wheel against said opposite side portion of a workpiece with constant force and independently from said first biasing means to follow the contour of said opposite side portion of the workpiece;

a third means for finishing a workpiece, including:

a third finishing wheel disposed for rotation about a horizontal axis adjacent an upper surface of a workpiece;

a third drive means supporting said third wheel and for causing rotation thereof,

a third frame member supporting said third wheel and third drive means and pivotally mounted to said frame structure for swinging movement about a horizontal axis so that said third wheel can move toward and away from said upper surface of a workpiece,

means interconnecting said third drive means and said third frame member for providing horizontal adjustment of said third wheel relative to said upper surface of a workpiece, and

means engaging said third frame member for biasing said third wheel against said upper surface of a workpiece with constant force and independently of said first and second biasing means to follow the contour of said upper surface of the workpiece; and

means for feeding a workpiece over said upper surface of said table so as to pass by and be acted upon by each of said finishing means.

4,323,100

ROUTER GUIDE

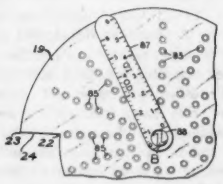
Howard Silken, 8676 Bridle Path Ct., Davie, Fla. 33328

Division of Ser. No. 129,175, Mar. 10, 1980, Pat. No. 4,291,735.

This application Jun. 18, 1981, Ser. No. 275,066

Int. Cl.³ B27C *5/10*

U.S. Cl. 144—134 D **4 Claims**



1. For use with a router having a motor-driven bit, the improvement which comprises:

a flat guide plate for attachment to the router having a central opening for passing the router bit and having a series of openings spaced apart along a spiral of progressively increasing radius which has said central opening as its center;

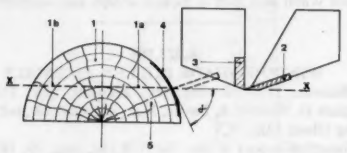
and a pivot member having an end which is releasably insertable into a selected one of said series of openings and having a pointed opposite end for insertion in a workpiece at the center for a circular groove to be cut in the workpiece by rotating said guide plate about said pivot member.

4,323,101

LOG SLICING PROCESS TO PRODUCE VENEER

Angelo Cremona, V.le Lombardia 275, Monza (Milano), Italy (20052)

Filed Sep. 6, 1979, Ser. No. 73,112
Claims priority, application Italy, May 16, 1979, 22692 A/79
Int. Cl.³ B27L *5/00*
U.S. Cl. 144—323 **5 Claims**



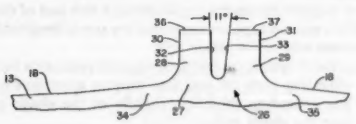
1. A process for slicing logs to produce a veneer comprising passing a log to be sliced through a curved cutting path about a fixed axis, varying the radius of curvature of said path about the fixed axis, contacting said log with a cutting means for slicing a veneer therefrom, wherein the step of passing said log through a curved cutting path includes moving said log radially away from said axis, moving said cutting means radially toward said axis, and wherein said steps of moving said log away from said axis and moving said cutting means radially toward said axis are performed simultaneously.

4,323,102

DIRT SEAL FOR REMOVABLE RUBBER BELTS

Robert E. Hall, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 872,529, Jan. 26, 1978, abandoned. This application Sep. 10, 1979, Ser. No. 73,591
Int. Cl.³ B60C *27/06, 27/00;* **B62D** *55/08*
U.S. Cl. 152—175 **13 Claims**



1. A removable annular belt for use in a track tire assembly which assembly includes a plurality of track members on the radially outer surface of said belt at circumferentially spaced-apart positions, said belt having on its radially outer surface a plurality of circumferentially spaced-apart sealing members,

each of said sealing members being of resilient material and extending tranversely of the circumferential direction of said belt,

each of said sealing members being integrally formed with the radially outer surface of said belt,

each of said sealing members including circumferentially extreme first and second legs projecting radially outwardly from the radially outer surface of said belt,

said first leg being joined to the radially outer surface of said belt by a first curved edge portion,

said second leg being joined to the radially outer surface of said belt by a second curved edge portion,

said first leg having connected to said first curved edge portion a first radial planar sealing face,

said second leg having connected to said second curved edge portion a second radial planar sealing face,

said first and second legs of each sealing member in their undeformed state being spaced-apart from one another in the circumferential direction of the belt defining a gap between them extending from their radially outermost ends radially inwardly an amount substantially equal to the radial dimension of said legs,

whereby the radial planar sealing face of each leg of each sealing member is adapted for sealing engagement with a corresponding one of said plurality of track members.

2. A removable track for an annular resilient tire comprising:

(a) an annular belt having a radially outer surface, and

(b) a plurality of track members mounted on said radially outer surface at circumferentially spaced-apart positions, each of said track members including a generally planar leading edge surface connected by a first curved surface to a belt engaging surface, and at its circumferentially opposite end, a generally planar trailing edge surface connected by a second curved surface to said belt engaging suface, said belt including

a plurality of sealing members integrally formed with the radially outer surface of said belt, one of said sealing members being disposed between each adjacent two of said track members,

each of said sealing members being of resilient material and extending transversely of the circumferential direction of said belt and having circumferentially opposite first and second curved edge portions at its juncture with said radially outer belt surface for engagement with the corresponding first and second curved surfaces of the corresponding adjacent track members,

each of said sealing members having adjacent its circumferential ends first and second legs projecting radially outwardly from said radially outer surface of said belt,

said first leg having a first generally radial planar sealing face on one circumferential side for engagement with the leading edge surface of the corresponding one of said track members, said sealing face being joined to the radially outer surface of said belt by said first curved edge portion,

said second leg having a second generally radial planar sealing face on the circumferentially opposite side for engagement with the trailing edge surface of the corresponding one of said track members, said sealing face being joined to the radially outer surface of said belt by said second curved edge portion,

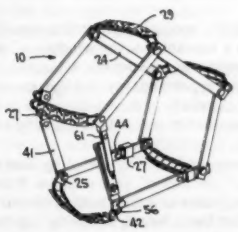
said first and second legs of each sealing member prior to installation of the respective track members on said belt being spaced-apart in the circumferential direction of said belt defining a gap between them extending from their radially outermost ends radially inwardly an amount substantially equal to the radial dimension of said first and second legs.

4,323,103

ANTI-SKID TIRE GUARD

Yoobong Kim, 5401 Rubolt Rd., Cincinnati, Ohio 45211

Continuation-in-part of Ser. No. 108,498, Dec. 31, 1979, abandoned. This application Aug. 1, 1980, Ser. No. 174,644
Int. Cl.³ B60C *27/00, 27/20*
U.S. Cl. 152—213 A **11 Claims**



1. An anti-skid tire guard for a vehicle tire which is adapted to be quickly mounted upon and dismounted from the tire

when said vehicle is positioned on the ground or similar support surface, said guard comprising:

(a) a first component comprising two generally parallel flexible strips spaced apart by a plurality of tread members positioned in a direction generally transverse to said strips, each of said strips having two ends and connectors at said ends;

(b) a second component comprising a third flexible strip having two ends, said ends comprising mating connectors adapted to be attached to the connectors on one of said two parallel strips, and a tread member having a first end attached to said third strip and a second end adapted to be connected to a latching member, said tread member adapted to extend transverse to said third flexible strip; and

(c) a third component comprising a latching member having a fourth flexible strip, said fourth flexible strip having a plurality of hinged slats, two mating connectors adapted to be connected to the connectors on the other of said two parallel strips, means for retaining said second component tread member and means for retaining two of said hinged slats in superposed folded relation, whereby said three components are attached by connecting said mating connectors, said guard being securely positioned about said tire by folding said two hinged slats in superposed relation.

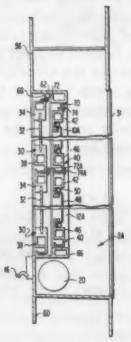
4,323,104
PROTECTIVE MEANS FOR DOOR AND WINDOW OPENINGS

Milton Guttman, 1719 Miami Gardens Dr., N. Miami Beach, Fla. 33162

Continuation of Ser. No. 663,215, Mar. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 466,798, May 3, 1974, abandoned. This application Feb. 26, 1980, Ser. No. 124,769

Int. Cl.³ E06B *3/30, 3/36*

U.S. Cl. 160—92 **5 Claims**



1. Apparatus for providing protection against unauthorized entry through a movable louver window of the awning type having a plurality of rectangular window panels pivotally carried at their upper ends by linkage means for swinging upwardly and exteriorly of the window, the panels and linkage means being supported and at least partially surrounded by a window frame, comprising:

a separate support frame supported by, and secured wholly within the confines of, said window frame and situated laterally adjacent at least a portion of said linkage means, said support frame having adjoining top, bottom, and side frame members and having exterior dimensions sufficiently small to avoid interference with the movement of said panels and said linkage means during their operation;

at least one substantially intrusion-proof sash having a security panel secured therein, said sash being supported within said support frame; and

lock means for locking said sash within said support frame from the interior side of said window, said lock means comprising at least one slot in at least one of the side frame members of said support frame and a latch element secured to said sash for sliding through said slot, said at least one side frame member having a receptacle surrounding the portion of said latch element extending through said slot when said sash is locked within said support frame.

4,323,105
WINDOW SHADE ROLLER ASSEMBLY

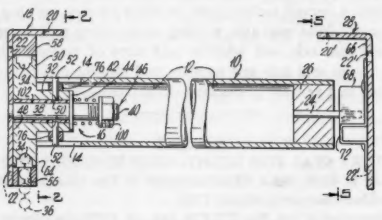
Joel Berman, 1470 Hewlett Ave., Hewlett, N.Y. 11557, and Stephen D. Weinreich, Parlin, N.J., assignors to Joel Berman, Long Island City, N.Y.

Continuation-in-part of Ser. No. 716,153, Aug. 20, 1976, Pat. No. 4,223,714. This application Mar. 8, 1979, Ser. No. 18,763

The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.³ E06B *9/20*

U.S. Cl. 160—309 **5 Claims**



1. A window shade roll assembly comprising in combination:

a shade roll;

a first support apparatus organized at a first and of the shade roll, a second support apparatus for supporting rotatably a second end of the shade roll;

an operator system on said first support apparatus including:

a mounting plate on said first support apparatus having a pin extending therefrom axially of the shade roll and into the shade roll,

a wheel mounted rotatably about the pin on said first support apparatus and having a face arranged in juxtaposition to the mounting plate,

the wheel having a hub of a diameter smaller than the shade roll and projecting therefrom opposite the face,

means for connecting detachably the hub that is on said first support apparatus to the shade roll,

biasing means connected to the hub for causing frictional contact of the face of the wheel against the mounting plate,

and a wheel turner mechanism;

the window shade roll assembly characterized in that all of the elements of said operator system are mounted on the first support apparatus.

4,323,106
KNOCK-OUT SYSTEMS FOR FOUNDRIES

Colin R. Bayliss, Redditch, England, assignor to BCIRA, Birmingham, England

Filed Mar. 17, 1980, Ser. No. 130,719

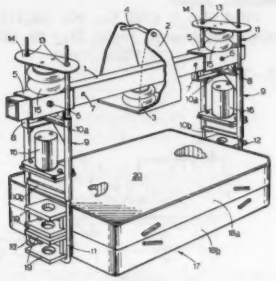
Claims priority, application United Kingdom, Mar. 27, 1979, 10556/79

Int. Cl.³ B22D *29/00*

U.S. Cl. 164—260 **3 Claims**

1. An apparatus for displacing a metal casting from a box formed of at least two relatively movable box frames posi-

tioned on top of each other and containing the casting in a mold of particulate material, said apparatus comprising in combination, suspension means by which the apparatus can be suspended from above, clamp means for clamping together the uppermost and lowermost of the box frames to render them incapable of relative movement, vibratory means for vibrating the box so as to shake the metal casting and particulate material



out of the box, and resilient means for opposing transmission of vibrations to said suspension means, said clamp means comprising abutment means for the uppermost box frame, two clamp frames for engaging opposite ends of the lowermost box frame, and a respective lifting device for raising each of said clamp frames whereby the lowermost box frame can be lifted towards said abutment means to clamp together the box frames.

4,323,107

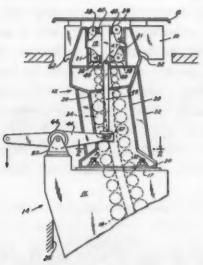
CONTINUOUS CASTING INSTALLATION

Joseph Pietryka, Paris, France, assignor to Fives-Cail Babcock, Paris, France

Continuation of Ser. No. 914,440, Jun. 12, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 75,975

Int. Cl.³ B22D *11/04, 11/12*

U.S. Cl. 164—416 **10 Claims**



1. An installation for casting molten ferrous metal into a continuous strand, which comprises a support structure, an oscillatory mold receiving the molten ferrous metal and discharging the continuous strand, and a guiding device arranged to receive the continuous strand from the mold and to guide the strand, the guiding device being comprised of an upper section including a frame and a lower section including a frame having a top adjacent the upper guiding device section frame, wherein

(a) the upper guiding device section frame is supported on, and affixed to, the top of the lower guiding device section frame,

(b) the upper guiding device section frame carries means for supporting and guiding the mold for oscillation,

(c) the lower guiding device section frame is mounted on the support structure of the installation,

(d) the lower guiding device section frame carries means for oscillating the mold, the oscillating means comprising

(1) an arm mounted for pivoting on the top of the lower guiding device section frame and remote from the mold,

(2) an actuating rod connecting the arm to the mold for oscillating the mold in response to the pivoting of the arm, and

(3) respective pivoting means connecting the actuating rod to the arm and to the mold, one of the pivoting means being readily detachable, and

(e) the upper guiding device section and the mold constitute a demountable and replaceable unit.

4,323,108

TUNDISH AND PROCESS FOR CASTING FROM CHARGE TO CHARGE IN CONTINUOUS STEEL FOUNDRY

Emil Fürjes, and Istvan Kecskes, both of Ozd, Hungary, assignors to Ozdi Kohaszati Üzemek, Ozd, Hungary

Filed Apr. 28, 1980, Ser. No. 144,372

Claims priority, application Hungary, May 2, 1979, OI225

Int. Cl.³ B22D *11/10*

U.S. Cl. 164—488 **7 Claims**

6. Process for pouring continuously a steel melt from a tapping ladle to a mold, which comprises the steps of:

(a) providing a tundish which comprises an elongated box-like container with a plurality of openings at the bottom thereof and an elongated pouring gate extending from one extremity thereof, a recess in said pouring gate and an upwardly sloping and upwardly broadening runner section connecting said recess to said container and having a sharp sloping wall at the end thereof opposite said recess;

(b) pouring said melt from a first charged tapping ladle into an intermediate section of said tundish;

(c) moving a second charged tapping ladle in position next to said first tapping ladle before the pouring from said first ladle is completed;

(d) pouring the melt from said second tapping ladle into said recess of said pouring gate of said tundish, thus causing said melt to flow through said upwardly sloping runner section of said tundish and into said intermediate section of said tundish; and

(e) alternating the pouring of said melt from a tapping ladle between said intermediate section of said tundish and said recess of said pouring gate.

4,323,109

OPEN CYCLE HEAT PUMP SYSTEM AND PROCESS FOR TRANSFERRING HEAT

Heinz Jaster, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1979, Ser. No. 69,776

Int. Cl.³ F28C *3/08*

U.S. Cl. 165—1 **4 Claims**

1. An open cycle heat transfer system for transferring heat from a heat source to a heat sink comprising:

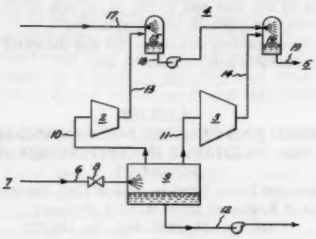
a means cooperating with said heat source for supplying source vapor;

a plurality of compressor means in parallel-arranged vapor communication with said source vapor supply means, with individual ones of said compressor means having predeterminately different capacities with respect to each other for raising the temperature and pressure of source vapor flowing therethrough;

means for conveying source vapor from said compressor

means, said conveying means being in flow communication with said heat sink;

wherein said source vapor conveying means includes a plurality of mixing chambers, with individual ones of said chambers each being in vapor communication with the exhaust of a cooperating one of said compressor means and being in flow communication with a means for supplying fluid of substantially the same liquid base as said source vapor, said mixing chambers being so arranged as to provide for the direct contacting of said fluid and said source vapor therein; and



wherein said plurality of mixing chambers are in flow communication with said means for supplying fluid in order of increasing capacity of the compressor means cooperating therewith.

4,323,110

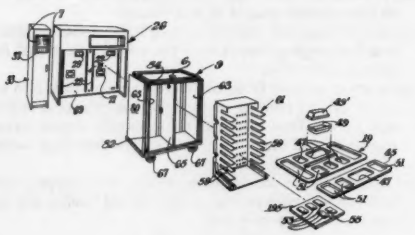
FOOD PREPARATION PROCESS

Harry A. Rubbright, Lancaster, Ohio, and Donald A. Springer, North Ridge, Calif., assignors to Anchor Hocking Corporation, Lancaster, Ohio

Continuation-in-part of Ser. No. 758,454, Jan. 11, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,661

Int. Cl.³ F25B *13/00*

U.S. Cl. 165—2 **23 Claims**



12. A method for preparing meals for hospitals, airlines and similar consumers comprising placing containers with lids and holding various types of food on a food tray, inserting a plurality of such food trays in vertical alignment on supports in an insulated food and beverage cabinet, closing the doors of said cabinet to create a closed compartment for the food trays, circulating chilled air in a first closed loop pattern in a plenum chamber having a chilled air source therein with normally closed inlets and outlets, coupling the food and beverage cabinet to the plenum chamber to open its inlets and outlets for creating flow communication between the plenum chamber and the food and beverage cabinet to provide a larger second closed loop therewith, continuously circulating the chilled air from the air source through the plenum chamber and the food and beverage cabinet uniformly around and over each of the food trays and then back to said chilled air source in the larger second closed loop, cooling the walls and the lids of the containers with the chilled air, selectively heating certain of the food containers, controlling the temperature of the food being heated, and continuing the circulation of the chilled air during the selective heating step.

4,323,111

TEMPERATURE CONTROL DEVICE FOR AUTOMOBILE AIR CONDITIONER

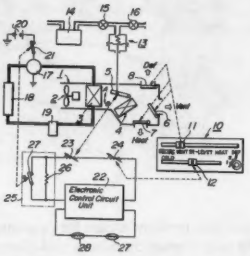
Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 2, 1980, Ser. No. 146,111

Claims priority, application Japan, May 10, 1979, 54-56330

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—25 **4 Claims**



1. A temperature control device for an automobile air conditioner including a plurality of outlets, an outlet-selecting means for selecting said outlets, a temperature regulating means, a temperature setting means, a first variable resistor whose resistance value changes with movement of said temperature regulating means, a second variable resistor whose resistance value changes with the movement of said temperature setting means, a sensor detecting air temperature in an automobile, an actuator for operating said temperature regulating means, an electronic control circuit for operating said actuator so as to obtain that air temperature in the automobile which is set by said temperature setting means while using inputs from said first and second variable resistors and the sensor detecting the air temperature in the automobile, a cooling unit, and an air conditioner switch for actuating a compressor of said cooling unit so as to make the automobile air conditioner usable for cooling and heating, said device characterized by having an adjusting means for adjusting virtual characteristics of one of the first and second variable resistors and said sensor in response to ON-OFF of said air conditioner switch, whereby the set temperature in the automobile is obtained irrespectively of operation and unoperation of said compressor during heating operation.

4,323,112

NO ENERGY BAND TEMPERATURE CONTROL

Howard C. Nordeen, Glenview, Ill., assignor to Mark Controls Corporation, Skokie, Ill.

Filed Mar. 6, 1979, Ser. No. 17,926

Int. Cl.³ F25B *29/00*; G05D *23/12*

U.S. Cl. 165—27 **8 Claims**

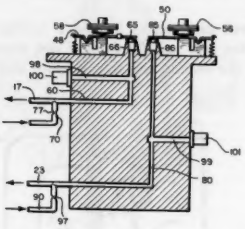
1. A system for controlling the temperature in an enclosed volume comprising:

heating means;

cooling means; and

a pneumatic thermostat including: a heating-control set point, a cooling-control set point, first means for sensing the temperature of the enclosed volume and the heating control set point and for generating a first pressure signal in response to the temperature in the enclosed volume and in response to the heating control set point, said first pressure signal activating or adjusting the operation of said heating means whenever the sensed temperature is

below the heating control set point, and second means for sensing the temperature of the enclosed volume and the cooling control set point and for generating a second pressure signal in response to the temperature in the enclosed volume and in response to the cooling control set point, said second pressure signal activating or adjusting the operation of said cooling means whenever the sensed



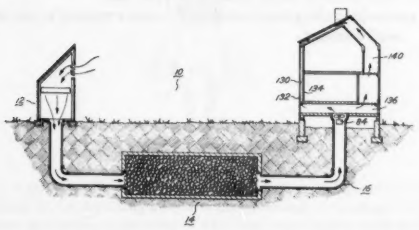
temperature is higher than the temperature in the enclosed volume, said first means and said second means continuously independently and simultaneously generating said first pressure signal and said second pressure signal respectively, the heating set point being lower than the cooling set point so as to define a no energy band of sensed temperatures at which neither heating means nor cooling means is operating.

4,323,113

UNDERGROUND AIR TEMPERING SYSTEM

LeRoy S. Troyer, 3019 Essex, South Bend, Ind. 46615

Filed Oct. 31, 1980, Ser. No. 202,587
Int. Cl.³ F24J *3/02*
U.S. Cl. 165—45 **24 Claims**



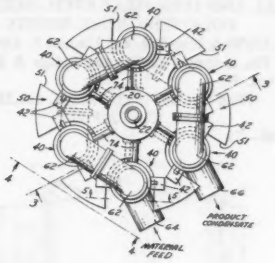
1. An open underground air tempering system for providing fresh makeup air to a building ventilation system from air outside the indoor building climate, comprising a heat exchanger disposed beneath the ground through which fresh outdoor air passes to be warmed during the winter and to be cooled during the summer by the ground temperature as modified by the flywheel phenomenon, said heat exchanger having a housing and heat transfer material substantially filling said housing for sufficiently increasing the surface area within said heat exchanger to transfer heat between the ground surrounding said housing and the air passing therethrough, a portion of said housing defining an air inlet opening through which the untempered fresh, outdoor air enters said heat exchanger and a second portion of said housing defining an air outlet opening through which tempered air flows from said heat exchanger, an air supply means connected to said air inlet opening for providing untempered air from said fresh, outdoor air to the tempering system, an air distribution network connected to said air outlet opening for bringing tempered air from said heat exchanger to the building ventilation system, and air circulation means for creating an air flow through said air supply means, said heat exchanger and said air distribution network.

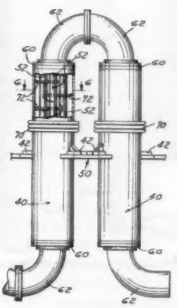
4,323,114

CLUSTER HEAT EXCHANGER

Gerald D. Corey, Hermosa Beach, Calif., assignor to Fansteel Inc., North Chicago, Ill.

Filed Mar. 26, 1979, Ser. No. 23,734
Int. Cl.³ F28F *9/26, 7/00*
U.S. Cl. 165—78 **1 Claim**





1. A heat exchanger apparatus for transferring heat from one fluid to another which comprises:

(a) a supported elongate first vertical central chamber divided laterally into a top inlet chamber for a heated treating fluid and a bottom condensate chamber for condensed treating fluid,

(b) a circular support rack positioned around said first vertical chamber having a plurality of radially extending segments forming a plurality of circumferentially spaced support recesses open to the periphery of said rack,

(c) a plurality of secondary symmetrical, invertible vertical elongate chambers having mounting extensions substantially centrally located intermediate the ends thereof to cooperate with said segments of said rack to removably support said secondary chambers in upright and invertible position as a circular cluster in said circumferentially spaced support recesses, said secondary chambers each having one or more first longitudinal passages for a treated fluid surrounded by a second essentially longitudinal, baffled passage for a treating fluid,

(d) said secondary chambers having identical and symmetrical flow connections at each end to said first and second passages respectively,

(e) means connecting the flow connections of said second passages at the tops and bottoms respectively of said invertible secondary chambers in parallel with the top and bottom chambers of said first vertical chamber to permit flow of treating fluid from said inlet chamber of said first

vertical chamber through each of said second passages of said secondary chambers and back to said condensate chambers, and

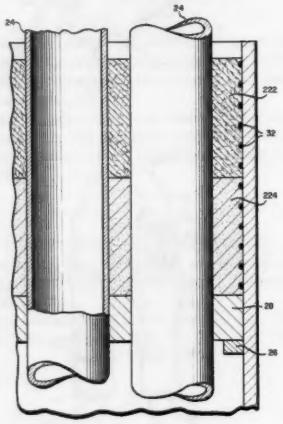
(f) means connecting the flow connections of said first passages in said secondary chambers alternately at the top and bottom of adjacent secondary chambers to permit series flow of treated material through said secondary chambers, wherein the flow of treating and treated material is essentially circular around said circular support and said first vertical chamber.

4,323,115

SHELL AND TUBE HEAT EXCHANGER WITH POLYMERIC TUBE SHEETS

Donald C. Stafford, Hinsdale, and Vincent F. Allo, Warrenville, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Sep. 26, 1980, Ser. No. 191,357
Int. Cl.³ F28F 9/16
U.S. Cl. 165—79 **2 Claims**



1. A heat exchanger comprising:

a plurality of spaced apart tubes;

a shell around the tubes;

a pair of spaced apart molded in place tube sheets of solid polymeric material bonded to the tubes and to the shell interior surface and providing the primary support for the tubes;

at least one tube sheet having a high tensile strength layer of polymeric material and a high compressive strength layer of polymeric material;

means to deliver a heat exchange fluid around the tubes inside of the shell between the tube sheets; and

means to deliver a liquid feed stream into a feed box partially defined by one of the tube sheets.

4,323,116

FLOW CONTROL APPARATUS

Charles J. Zimmerman, Monroe, Mich., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,512
Int. Cl.³ F28F 27/02
U.S. Cl. 165—97 **5 Claims**

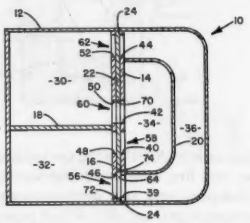
1. A flow control apparatus for use with a heat exchanger having a plurality of heat exchange tubes, the flow control apparatus comprising:

a housing;

means dividing the housing into a first compartment for communication with a first set of heat exchange tubes, a second compartment for communication with a second set of heat exchange tubes, an inlet compartment for connection to an external fluid source, and an outlet compartment for discharging fluid from the housing;

the dividing means defining a first port for transmitting fluid between the first and outlet compartments, a second port for transmitting fluid between the first and inlet compartments, a third port for transmitting fluid between the second and inlet compartments, and a fourth port for transmitting fluid between the second and outlet compartments;

flow control gate means having a normal flow position closing the first and third ports and allowing fluid flow through the second and fourth ports, and a reverse flow



position closing the second and fourth ports and allowing fluid flow through the first and third ports;

the dividing means inclusing a first wall member, and the flow control gate means including a second wall member generally parallel to the first wall member and slidably disposed adjacent thereto, with the second wall member slidably moved relative to the first wall member to change the flow control gate means between the normal and reverse flow positions;

wedges for moving the second wall member into fluid tight, abutting contact with the first wall member as the second wall member slides relative thereto; and

means for sliding the second wall member relative to the first wall member.

4,323,117

METHOD AND MEANS FOR EMERGENCY SHEARING AND SEALING OF WELL CASING

Laurance Pierce, 4652 Tonywatha Trail, Monona, Wis. 53716

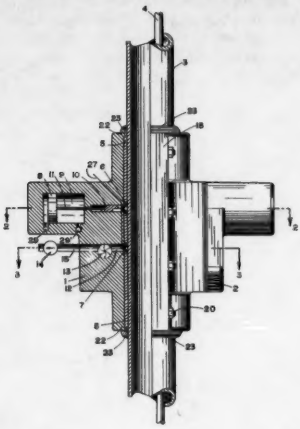
Filed Apr. 23, 1980, Ser. No. 143,023
Int. Cl.³ E21B 29/08, 33/06
U.S. Cl. 166—55 **10 Claims**

1. Apparatus for being applied externally to a well casing to girdle it for emergency shearing of the casing to terminate uncontrolled flow from a well comprising

a longitudinally split body structure configured for being operably fastened to girdle a well casing,

ram means housed in said body actuatable to traverse said casing transversely to the axis of said casing for sealing said casing against uncontrolled flow therethrough,

shaped charge explosive means provided in said body structure disposed for being actuated to ring said casing with



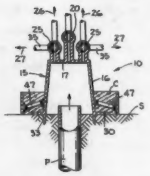
perforations at an elevational level substantially the same as that of said ram means.

4,323,118

APPARATUS FOR CONTROLLING AND PREVENTING OIL BLOWOUTS

Conrad E. Bergmann, 1365 Lincoln Ave., San Jose, Calif. 95125

Filed Feb. 4, 1980, Ser. No. 118,578
Int. Cl.³ E21B *33/037*
U.S. Cl. 166—96 **7 Claims**



1. Apparatus for controlling oil blowouts in oil rigs, oil wells and the like comprising a hollow dome having an exterior wall, means providing a plurality of discharge openings in said wall, a valve communicating with each of said openings and adapted to control the flow of fluid through the openings, and a pair of conduits connected to each valve, one conduit leading to a storage facility and the other conduit providing a blow off passage, each valve being movable between a first position establishing communication between the associated storage conduit and the associated discharge opening and a second position communicating the discharge opening with said blow-off passage.

4,323,119

VIBRATORY APPARATUS FOR MINING SHALE OIL OR THE LIKE

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Division of Ser. No. 12,669, Feb. 16, 1979, Pat. No. 4,252,189.
This application Nov. 24, 1980, Ser. No. 209,527
Int. Cl.³ E21B *43/00*; E21C *37/20*
U.S. Cl. 166—177 **4 Claims**

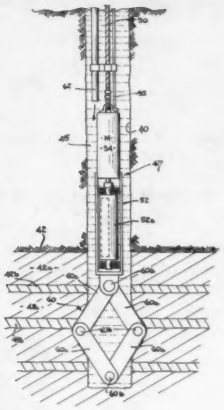
1. Apparatus for in situ removal of kerogen or the like from oil shale deposits from a well including such deposits along the side walls of the well bore comprising:

sonic radiator means,

means for suspending the sonic radiator means in said well adjacent to said deposits,

means for flowing a carrier liquid into the well in contact with said deposits,

means for providing high level sonic energy to said radiator means for driving said radiator means against the side



walls of the well and comminuting the oil shale along said side walls to shale and kerogen particles, the kerogen particles rising toward the top of said liquid with the shale particles falling to the bottom of said liquid, the bore of the well being laterally enlarged as the oil shale is comminuted, and

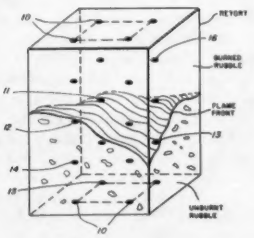
means for removing said liquid from the well.

4,323,120

METHOD FOR CONTROLLING UNDERGROUND COMBUSTION

Irwin Ginsburgh, Morton Grove, and Robert D. Hall, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 925,181, Jul. 17, 1978, Pat. No. 4,271,904.
This application Aug. 1, 1980, Ser. No. 174,602
Int. Cl.³ E21B *43/247, 47/06, 47/12*
U.S. Cl. 166—251 **2 Claims**



TRANSMITTER METHOD — TRANSMITTER ARRAY IN VERTICAL RETORT

1. In the in-situ combustion of a subterranean carbonaceous stratum, a method of controlling an underground flame front comprising

(a) monitoring the extent and movement of said flame front to determine the location of one or more segments of the flame front which exhibit unfavorable combustion characteristics by means of the Transmitter Method, wherein

one or more transmitters are placed within a retort capable of sensing and transmitting information concerning at least one of the properties of temperature, gas pressure, mechanical pressure, gas flow rate, gas composition, and directional mechanical force, and

(b) injecting and controlling the flow of one or more gases into the vicinity of one or more of said segments to control and optimize the combustion in said segment.

4,323,121

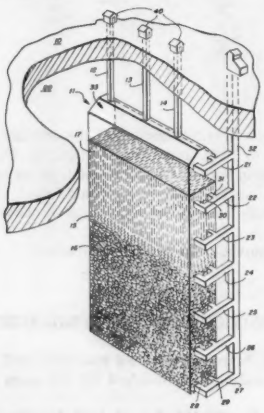
METHOD FOR CONTROLLING UNDERGROUND COMBUSTION

Irwin Ginsburgh, Morton Grove, and Robert D. Hall, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 925,181, Jul. 17, 1978, Pat. No. 4,271,904. This application Aug. 1, 1980, Ser. No. 174,603

Int. Cl.³ E21B *43/247, 47/12*

U.S. Cl. 166—251 **2 Claims**



1. In the in-situ combustion of a subterranean carbonaceous stratum, a method of controlling an underground flame front comprising

(a) monitoring the flame front to determine the location of one or more segments of the flame front which exhibit unfavorable combustion characteristics by means of the Sound Detection Method which comprises

detecting at a plurality of known positions relative to said oil shale retort the acoustic energy generated by said flame front by moving a pair of matched hydrophones separated by a fixed known distance through a well bore which is liquid-filled and which has been drilled such as to traverse, at a known distance thereto, a sidewall of said retort of which the flame front is intended to pass along during the in-situ combustion,

determining the position of the source of the acoustic energy from the received signals by leading the outputs from said pair of matched hydrophones to a differential amplifier and recording the resulting difference as a function of the position of said pair of matched hydrophones in said well bore such that a minimum in said resulting difference corresponds to the position of the flame front in said oil shale retort, and

(b) injecting and controlling the flow of one or more gases into the vicinity of one or more of said segments to control and optimize the combustion in said segment.

4,323,122

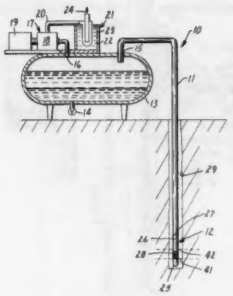
PROCESS FOR RECOVERING ORGANIC LIQUIDS FROM UNDERGROUND AREAS

Dwayne L. Knopik, P.O. Box 33427, St. Paul, Minn. 55133

Filed Jun. 2, 1980, Ser. No. 155,307

Int. Cl.³ E21B *43/00, 43/34*

U.S. Cl. 166—267 **2 Claims**



1. A process for recovering organic liquids such as gasoline from the surface of the water table in underground areas, said process comprising the following steps;

(1) providing an opening in the ground from the ground surface to a point beneath the upper surface of the water table;

(2) positioning within said opening a conduit having a lower end in fluid-tight relationship with a collection head having a closed liquid impermeable lower end portion, an open upper end fitted onto the lower end of said conduit, and a liquid permeable wall portion intermediate said liquid impermeable lower end portion and said upper end;

(3) positioning said collection head so that the liquid permeable wall portion is just above the surface of the water table and the liquid impermeable lower end portion of said collection head is just below the surface of the water table;

(4) connecting the upper end of said conduit to an inlet of a collection vessel having a vapor outlet to permit the removal of air and other gaseous materials but not substantial amounts of liquid from said vessel; and

(5) exhausting air and other gaseous materials from said vessel through said vapor outlet to create less than atmospheric pressure in said vessel whereby to draw organic liquids from the surface of the water table through said conduit into said vessel.

4,323,123

GELLED COMPOSITIONS AND WELL TREATING

Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 925,357, Jul. 17, 1978, Pat. No. 4,246,124. This application Aug. 6, 1980, Ser. No. 175,811

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.³ E21B *43/26*

U.S. Cl. 166—302 **9 Claims**

1. A process for hydraulically fracturing a subterranean formation penetrated by at least one well which comprises:

injecting into the formation under pressure sufficient to fracture the formation a gelled polymer-containing composition comprising

(a) water,

(b) a water-thickening amount of a water-dispersible polymer selected from the group consisting of cellulose ethers, polyacrylamides, and biopolysaccharides or heteropolysaccharides produced by the action of bacteria of the genus Xanthomonas upon carbohydrates,

(c) a small, but effective amount in the range of 0.02 to 2 weight percent; of at least one aldehyde component selected from the group consisting of aliphatic monoaldehydes having from 1 to about 10 carbon atoms per molecule, glyoxal, glutaraldehyde, and terephthaldehyde, and

(d) a small, but effective amount in the range of 0.005 to 2 weight percent of at least one phenolic compound selected from the group consisting of phenol, catechol, resorcinol, phloroglucinol, pyrogallol, 4,4'-diphenyl, 1,3-dihydroxynaphthalene, 1,4-benzoquinone, hydroquinone, quinhydrone, and quebracho which amounts of aldehyde (c) and phenolic compound (d) are sufficient to cause gelation of an aqueous dispersion of polymer (b) and form said gelled composition,

maintaining said composition in said formation in contact therewith for a period of time sufficient to significantly increase formation permeability, and

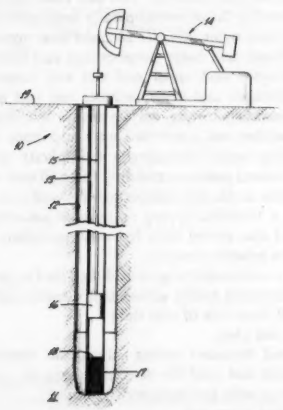
fracturing said formation to stimulate the production of fluids therefrom.

4,323,124

METHOD OF INHIBITING GRAVEL PACK AND FORMATION SANDSTONE DISSOLUTION DURING STEAM INJECTION

Philip G. Swan, Fountain Valley, Calif., assignor to Sigma Chemical Corporation, Santa Ana, Calif.

Filed Sep. 2, 1980, Ser. No. 183,147
Int. Cl.[3] E21B *43/22, 43/24*
U.S. Cl. 166—303 **23 Claims**



21. A method of inhibiting dissolution or erosion of a silicious material subject to aqueous fluids at elevated temperatures produced concurrently with steam comprising:

coating said silicious material with a chemical composition, the active ingredient in which is lecithin.

4,323,125

ROTARY WEEDING MACHINE

Normand Pronovost, 256, Rte. 159, St-Tite, Co. Laviolette, Prov. of Quebec, Canada (G0X 3H0)

Filed Jan. 28, 1980, Ser. No. 116,240
Int. Cl.[3] A01B *33/06, 39/08*
U.S. Cl. 172—59 **1 Claim**

1. A rotary weeding machine for removing weeds and working the soil between spaced rows of plants, comprising:

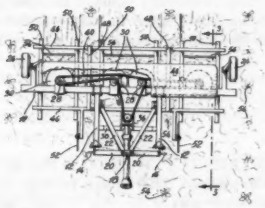
(a) a transverse tool bar adapted to be attached at its central portion to the regular three-point hitch of a tractor end of a length for extending above several rows of plants transverse to the direction of travel;

(b) two ground-engaging wheels mounted one at each end of said tool bar for supporting said tool bar above the ground;

(c) a plurality of vertical shafts mounted for rotation on said tool bar and each supporting a soil-working device adapted to cut the weeds and work the soil between the rows of plants, said soil-working devices arranged to form a central pair of adjacent devices to work the soil between two rows of plants, and two spaced outermost devices arranged to work half the width of the soil on the outside of said two rows of plants;

(d) each soil-working device comprising a disc attached to the lower end of each shaft and a number of tines extending downwardly from each disc, the lowermost end of each tine being bent over so as to extend at least to a small inclination to the horizontal for cutting the weed, all of said soil-working devices being of the same size;

(e) means for adjustably mounting the height of said bar with respect to the axis of the wheels so as to vary the working depth of said soil-working devices;



(f) two longitudinally-spaced transverse beams secured to and extending below said tool bar, and a plurality of vertical longitudinal plates secured to said transverse beams and extending transverse to said tool bar, on each side of said central pair of soil-working devices and on each side of each of said outermost soil-working devices, for confining earth and weeds displaced by said soil-working devices;

(g) a transverse vertical plate secured between adjacent vertical longitudinal plates at the back of said soil-working devices for levelling the soil after the passage of said soil-working devices;

(h) vertical rotary discs carried by one of said transverse beams and each located ahead of, and in line with, one of said vertical longitudinal plates for cutting the soil ahead of the plates;

(i) means for coupling said shafts to the regular power take-off of the tractor, said means driving the shafts of said cental pair of devices in opposite direction; and

(j) wherein the lower edge of said plates and of said rotary discs is substantially at the same level and slightly lower than the lowermost ends of said tines.

4,323,126

RIDGE MULCH TILLAGE METHOD AND APPARATUS

Larry F. Stikeleather, New Berlin, and David S. Totten, Greendale, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

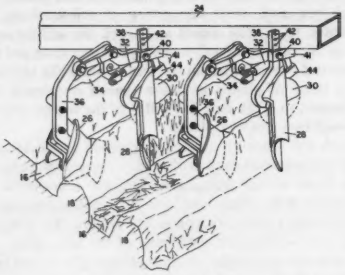
Filed Dec. 31, 1979, Ser. No. 108,838
Int. Cl.[3] A01B *13/14*
U.S. Cl. 172—147 **13 Claims**

1. Apparatus for preparing a field having rows of crop residue for subsequent row crop planting comprising:

a diagonal horizontal plow frame;

a plurality of furrow cutting and ridge forming moldboards affixed to said plow frame and spaced apart a distance approximately equal to the spacing between said crop

rows so as to cut furrows between crop rows and turn the soil lifted form the furrows onto surfaces not worked by said moldboards, thereby leaving unfilled the furrows created by the moldboards; and



a plurality of trash boards affixed to said plow frame in alternating relation to said moldboards and spaced apart a distance approximately equal to the spacing between said crop rows and adapted to transport the unplowed crop residue into said furrows cut by said moldboards.

4,323,127

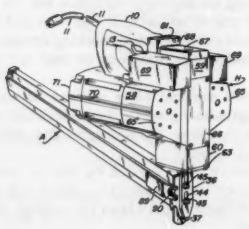
ELECTRICALLY OPERATED IMPACT TOOL

James D. Cunningham, 2100 Topaz, Boulder, Colo. 80302

Continuation-in-part of Ser. No. 799,092, May 20, 1977, abandoned. This application Mar. 9, 1979, Ser. No. 19,073

Int. Cl.³ B25C *1/06*

U.S. Cl. 173—53 **27 Claims**



1. In an impact tool for producing an impact against an object:

(a) elongated ram means mounted for movement along a longitudinal path, in opposite directions;

(b) a pair of oppositely rotating bodies for storing energy and mounted on opposite sides of said ram means for movement toward and away from said ram path, each said body having an axis of rotation generally perpendicular to the direction of movement of said ram means;

(c) means for moving said bodies substantially simultaneously toward and into engagement with said ram means on the respective side thereof, whereby said rotating bodies impart linear movement to said ram means;

(d) said moving means including force multiplying means and means for moving said force multiplying means;

(e) said means for moving said force multiplying means being electrically actuated;

(f) means for moving said bodies away from the path of said ram means; and

(g) means for returning said ram means to its initial position.

4,323,128

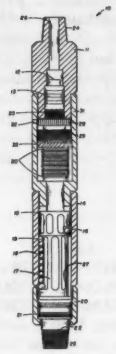
SPRING ADJUSTMENT SYSTEM FOR DRILL STRING TOOL

James W. Young, Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 710,754, Aug. 2, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,200

Int. Cl.³ E21B *17/07*

U.S. Cl. 175—57 **2 Claims**



1. A method of earth boring, comprising the steps of:

providing a torque transmitting well tool having an outer member, an inner member with said outer member and said inner member being telescopically arranged, an upper seal between said outer member and said inner member, a lower seal between said outer member and said inner member, a fluid between said upper seal and said lower seal, spline means between said outer member and said inner member for transmitting torque, spring means connected with said outer member and connected with said inner member with said spring means including a multiplicity of disc spring units, a central passage extending through said well tool, and connection means for connecting said well tool to drill pipe;

providing a threaded spring adjustment member connected with said disc spring units for axial movement in said well tool upon relative rotation;

providing a removable plug in said well tool to provide access to said threaded spring adjustment member and to seal said well tool from loss of said fluid;

removing said plug;

rotating said threaded spring adjustment member with an adjustment tool until the desired change of position of said disc spring units has been accomplished;

replacing said plug; and

connecting said well tool to drill pipe for rotation and earth boring.

4,323,129

HOLE DIGGING APPARATUS AND METHOD

William J. Cordes, 330 F St., Bakersfield, Calif. 93304

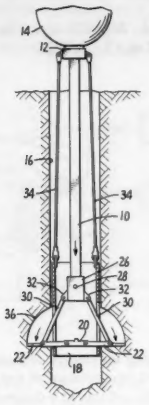
Filed Feb. 25, 1980, Ser. No. 124,537

Int. Cl.³ E21B *10/32*

U.S. Cl. 175—285 **5 Claims**

1. Apparatus for belling a drill hole comprising in combination with a Kelly bar, Kelly nut and drive means therefor a pair of pivotally mounted bell-cutting blades, first means including cable means interconnecting said Kelly nut and first pivotal axes of said blades operable to maintain the level of said axes a fixed distance above the bottom of the drill hole while said blades are rotated about said fixed level axes as centers of rotation into and out of bell-cutting positions, and second

means comprising said Kelly bar connected to second pivotal axes of said blades and operable to vertically move the same to



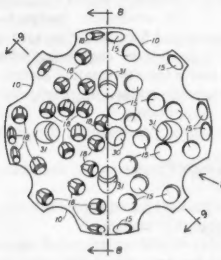
effect movement of said blades into and out of bell-cutting positions.

4,323,130

DRILL BIT

Mahlon Dennis, Houston, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Jun. 11, 1980, Ser. No. 158,389
Int. Cl.³ E21B *9/02*
U.S. Cl. 175—329 **16 Claims**



1. A drill bit comprising

a drill body having a hollow tubular body adapted to be connected to a drill string,

said drill body having an exterior peripheral stabilizer surface and an end cutting face,

said end cutting face having a plurality of cylindrical recesses spaced therearound in a selected pattern,

each of said recesses having an offset cylindrical counterbore extending for a depth of a fraction of the depth of the adjacent recess,

a plurality of cutting elements, one for each of said recesses,

said cutting elements each comprising a cylindrical supporting stud of sintered carbide having an angularly oriented supporting surface with a disc shaped element bonded thereon comprising a sintered carbide disc having a cutting surface comprising polycrystalline diamond,

said disc shaped elements on said cutting elements have a peripheral bevel on said diamond cutting surface,

each of said cutting elements being positioned in one of said recesses by an interference fit with said disc shaped element partially recessed in said counterbore,

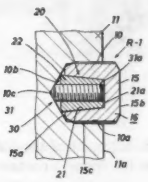
said counterbores being positioned to orient said discs with their cutting surfaces facing the direction of rotation of the bit and being of a size relieving stresses on said supporting studs during cutting operation.

4,323,131

REMOVABLE ANTI-WEAR INSERT

Jimmy L. Allee, Houston, Tex., assignor to Baker Service Company, Inc., Houston, Tex.

Filed Sep. 8, 1980, Ser. No. 185,152
Int. Cl.³ E21B *10/62, 17/10, 17/12*
U.S. Cl. 175—413 **12 Claims**



1. A removable anti-wear insert adapted to be mounted in a bore of a tool body and which can be removed after wear with minimal damage to the tool body, comprising:

a wear resistant insert body having first and second end surfaces and a side surface configuration therebetween adapted to substantially conform to the configuration of a bore in a tool body, said first surface of said insert being positionable within said tool body bore, said insert having a bore located in said first surface and extending into said insert body, said second surface of said insert body and a portion of said body forming a wear portion adapted to protrude outwardly of said tool body bore to provide a predesignated wear surface to increase the life of said tool body, the remainder of said insert body formed by said first end surface and said side surface providing an initially unexposed portion adapted to be positioned in said tool body; and

extractor means mounted in said insert body bore and being adapted to be located with said initially unexposed portion of said insert body in said tool body bore, said extractor means being exposed upon wear of said wear portion of said insert for extracting said insert from tool body bore.

4,323,132

MOUNTING ADAPTER FOR A FORK LIFT TRUCK

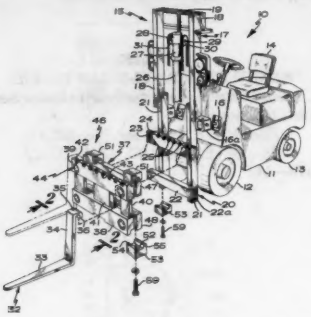
Richard S. Bradley, Fairmont, Minn., assignor to Weigh-Tronix, Inc., Fairmont, Minn.

Continuation-in-part of Ser. No. 180,802, Aug. 25, 1980. This application Apr. 6, 1981, Ser. No. 251,051
Int. Cl.³ G01G *19/08, 23/00*
U.S. Cl. 177—139 **3 Claims**

1. A mounting adapter for mounting an electro-mechanical scale on a fork lift truck having a lift frame structure and having lifting forks, the scale including a scale frame, having a pair of horizontal frame elements, for supporting the lift forks and a plurality of deformable members on the scale frame, and a plurality of electrical resistant strain gages mounted on each deformable member to sense the deformation of the latter, circuit means producing output signals caused by deformation of the deformable members means and means for converting the output signals into a perceptive weight readout, said mounting adapter including,

a pair of transverse frame members secured to the scale frame elements by the deformable members and clamping means on said frame members including a plurality of clamping elements engaging said transverse members and

the lift frame structure, and means securing said clamping elements to one of said frame members to permit quick



attachment and detachment of the mounting adapter and scale frame on the lift frame structure.

4,323,133

FOLDING FRAMEWORKS AND WHEEL-CHAIRS

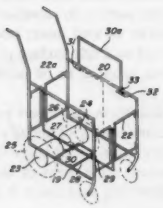
Patrick Y. Williams, Golden Eagles Flats, 6 Fawcett St., Ballina, New South Wales, Australia (2478)

Filed Feb. 29, 1980, Ser. No. 125,881

Claims priority, application Australia, Mar. 5, 1979, PD7895; Apr. 5, 1979, PD8294

Int. Cl.³ B60K *1/02;* **B62B** *7/06;* **A61G** *5/02*

U.S. Cl. 180—55 R **10 Claims**



1. In a motorized folding wheelchair comprising side frames mounting respective front and rear wheels, the rear wheels each having an electric motor connected thereto, the structure being adapted to carry an electric battery to drive the motors and control equipment for controlling the motors, front and rear toggle braces each comprising two hingeably connected arms extending between the front and rear ends of the side frames, a linking element interconnecting the front and rear toggle braces at the region of central hinges thereof, the improvement comprising the hinges being similarly offset relative to the fore/aft central plane of the vehicle, a latching arm hingeably mounted to one of the side frames about an axis substantially parallel to the linking element, the linking element carrying latch means engageable with the arm when it is in a downwardly displaced locking position to hold the toggle braces in an extended and locked position in normal use, and a diagonal bracing element pivotally connected adjacent opposite corners of the structure and extending below the linking element and latching arm, whereby folding of the wheelchair is initiated by upward displacement of said latching arm which engages with the latch means of the linking element to displace the linking element rearwardly thereby causing said toggle braces to commence folding.

4,323,134

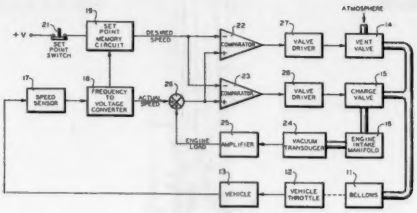
VEHICLE SPEED CONTROL CIRCUIT

Larry O. Gray, Greens Fork, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 28, 1979, Ser. No. 16,020

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—176 **9 Claims**



1. In a vehicle having an engine and an associated throttle control means, a speed control circuit for automatically maintaining the speed of the vehicle at a desired speed, comprising:

a source of an electrical signal representing the actual speed of the vehicle;

a source of an electrical signal representing the desired speed of the vehicle;

a source of an electrical signal representing the load on the engine of the vehicle; and

means responsive to said actual speed signal, said desired speed signal and said engine load signal for generating a control signal to the throttle control means to maintain the speed of the vehicle at the desired road speed, said control signal generating means including means responsive to said actual speed signal and engine load signal for generating a composite feedback signal and a comparator means responsive to said composite feedback signal and said desired speed signal for generating said control signal.

6. In a vehicle having an engine including an associated intake manifold and a throttle control means, a speed control circuit for automatically maintaining the speed of the vehicle at a desired speed, comprising:

a source of a signal representing the actual speed of the vehicle;

a source of a signal representing the desired speed of the vehicle;

a source of a signal representing the magnitude of the intake manifold vacuum pressure;

means responsive to said actual speed signal and said manifold vacuum pressure signal for generating a composite feedback signal; and

means responsive to said desired speed signal and said composite feedback signal for generating a control signal to the throttle control means to maintain the speed of the vehicle at the desired road speed.

4,323,135

STRUCTURE FOR SUPPORTING A MOTORCYCLE ENGINE

Nobuyoshi Tominaga, Hamamatsu; Nobuyoshi Kurai, Iwata; Hajime Ueno, and Sadahide Suzuki, both of Shizuoka, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

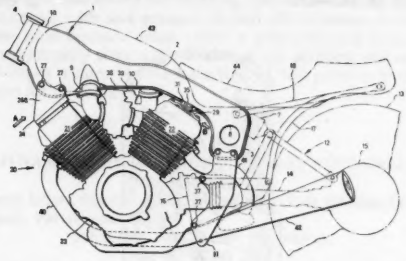
Filed Mar. 11, 1980, Ser. No. 129,330

Int. Cl.³ B60K *5/12*

U.S. Cl. 180—228 **3 Claims**

1. In combination: a V-shaped internal combustion engine having a front cylinder, a rear cylinder, and a crankcase joining said cylinders in a V-shaped array, said crankcase having a substantial dimension extending rearwardly of said front cylinder, and forming a generally V-shaped structure with it; a motorcycle frame having a portion overhanging said cylinders,

and a rear portion rearward of said engine forming a generally V-shaped structure, said frame having an axis of forward motion, said engine being mounted to said frame with the top of said front cylinder rigidly mounted to said frame portion, said crankcase being rigidly connected to said rear frame portion, the said structures forming a generally diamond-shaped rigid



array, said rear cylinder extending toward said frame; and elastic means elastically attaching said rear cylinder to said frame enabling said rear cylinder to change its orientation relative to said front cylinder and crankcase without distortion of said engine caused by the interconnection of the top of said rear cylinder and said frame.

4,323,136

MOVEMENT STOPPING SAFETY DEVICE FOR AGRICULTURAL MACHINE

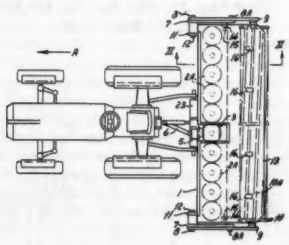
Cornelis van der Lely, Zug, Switzerland, and Ary van der Lely, Maasland, Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Dec. 4, 1979, Ser. No. 100,269

Claims priority, application Netherlands, Dec. 8, 1978, 7811965

Int. Cl.³ B60R *21/00*

U.S. Cl. 180—271 **9 Claims**



1. An agricultural machine comprising a rotary member that is moved during operation of said machine, a protective mechanism operatively associated with said member and positioned to prevent the movement of the same responsive to the actuation of monitor means, said monitor means being sensitive to a proximate external object to interrupt the movement of said rotary member, drive means connected to operate said machine through an overload coupling and said mechanism comprising a control device which interrupts drive to said machine upon actuation of said monitor means, said control device including a blocking member and the actuation of said monitor means causing said blocking member to retard the movement of a rotary shaft of said drive means whereby said overload coupling disengages the drive to the machine.

4,323,137

WORK VEHICLE

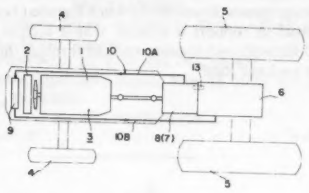
Niro Bando, Sakai; Junji Miyata, Koaza-yakimachi; Masatsugu Tone, Hashimoto, and Haruo Watanabe, Izumi, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Feb. 29, 1980, Ser. No. 126,067

Claims priority, application Japan, Mar. 9, 1979, 54/30694[U]

Int. Cl.³ B60K *17/10*

U.S. Cl. 180—305 **3 Claims**



1. A work vehicle, comprising:

an engine **(1)**,

a hydrostatic transmission **(7)** operatively connected to said engine **(1)** and disposed within a first housing **(8)**,

a second housing **(6)** integrally connected to said first housing **(8)** and containing therein a transmission gearing, said second housing **(6)** serving as a reservoir for actuating oil for said hydrostatic transmission **(7)**,

pump means **(7C)** for feeding actuating oil from said second housing **(6)** to said first housing **(8)**,

a cooling circulation system **(10)** for cooling the actuating oil for said hydrostatic transmission **(7)**, said cooling circulation system **(10)** including a cooler **(9)**, a supply conduit **(10A)** for supplying the actuating oil heated by said hydrostatic transmission **(7)** to said cooler **(9)** from said first housing **(8)**, and a return conduit **(10B)** for returning the actuating oil cooled by said cooler **(9)** to said second housing **(6)** from said cooler **(9)**, and

a bypass **(12)** disposed independently of said cooling circulation system **(10)** and having a relief valve **(13)**, said bypass **(12)** being formed to pass through a connection wall portion **(11)** of said first housing and a connection wall portion **(11')** of said second housing

whereby the actuating oil in said first housing **(8)** is directly returned to said second housing **(6)** from said first housing **(8)** without passing through said cooling circulation system **(10)** when the oil pressure in said first housing **(8)** exceeds a predetermined value.

4,323,138

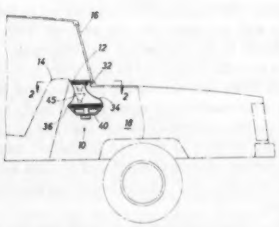
AUTOMOTIVE LOUD SPEAKER ENCLOSURE

Larry D. Horner, Houston, Tex., assignor to Horner Industries, Houston, Tex.

Filed May 5, 1980, Ser. No. 146,256

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—147 **8 Claims**



1. For use in an automobile having a package shelf opening into the passenger compartment with a space below the pack-

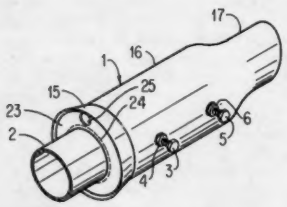
age shelf, a loud speaker enclosure which comprises an axially open enclosure housing having an oval opening at one end with a mounting means located at that end to be mounted to a package shelf at an opening cut in the package shelf to match the oval opening thereat, and further wherein said housing includes an upper portion which tapers downward from said oval opening and a lower portion which flares to a generally circular, open end for receiving thereon a speaker having a diameter sufficiently large that it cannot be mounted directly at the package shelf and wherein said housing extends from said mounting means downwardly when installed below said package shelf to support a speaker which directs speaker-made sound through said housing and out through the oval opening at the package shelf.

4,323,139

ENERGY SAVING EXHAUST SIPHON

Nealy B. Baldwin, 8915 University Blvd., North Charleston, S.C. 29405

Filed Oct. 1, 1980, Ser. No. 192,919
Int. Cl.³ F01N *1/14*
U.S. Cl. 181—263 **7 Claims**



1. A device for attachment to the tailpipe of an exhaust system of a vehicle comprising:

a. a body portion adapted to be placed around said tailpipe, but spaced apart from said tailpipe, in a manner that air may easily flow between said body portion and said tailpipe when said vehicle is moving in a forward direction;

b. a narrowing portion secured to said body portion and adapted to be located in the area of the outer end of said tailpipe, said narrowing portion having a circumference equal to said body portion at one end and a circumference smaller than the circumference of said body portion at the end furtherest away from said body portion, whereby said air, flowing between said tailpipe and said body portion when said vehicle is moving in a forward direction, will be compressed;

c. an exhaust discharge portion connected to said narrowing portion and operative for the exhaust from said tailpipe and said air to be discharged therethrough;

d. a flared portion connected to said body portion on the side opposite from said narrowing portion, said flared portion having a circumference equal to said body portion at one end and a circumference larger than the circumference of said body portion at the end furtherest away from said body portion, whereby said flared portion aids in the flow of said air when said vehicle is moving in a forward direction; and

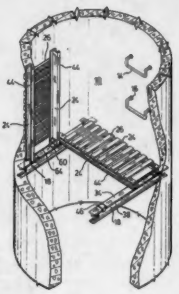
e. mounting means adjustably secured into the outer surface of said body portion, and adapted to hold said body portion spaced apart from said tailpipe.

4,323,140

SAFETY LANDING

Anthony Foscarini; John Foscarini, and Corrado Comello, all of 17 Malley Rd., Scarborough, Ontario, Canada (M1L 2E4)

Filed Jul. 18, 1980, Ser. No. 170,115
Claims priority, application Canada, May 9, 1980, 351629
Int. Cl.³ E04G *3/14, 1/36*
U.S. Cl. 182—128 **13 Claims**



1. A safety platform for use in a vertical shaft defined by a wall, said platform comprising:

(a) a pair of support beams, each support beam having two ends which are mounted in the inner surface of said wall;

(b) at least one panel which extends across the shaft and which bridges said support beams;

(c) a moveable securing means adapted to releasably secure one end of the at least one panel to one of said support beams; and

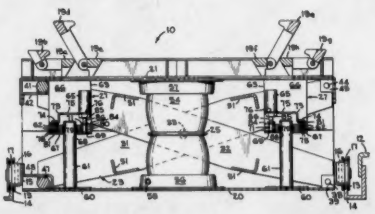
(d) a pivotting means adapted to pivotally secure the other end of the at least one panel to the opposite support beam.

4,323,141

RAIL-MOUNTED VEHICLE JACK

Marshall P. Ragan, Mayflower, and Peter H. Sytsma, Greenbrier, both of Ark., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 11, 1980, Ser. No. 129,306
Int. Cl.³ B66F *7/18*
U.S. Cl. 187—8.47 **11 Claims**



1. A mobile vehicle jack for use with a vehicle lift including spaced runways for supporting the wheels of an automotive vehicle, said jack comprising a frame structure extending between said runways, means mounting the jack for travel along said runways, a platform mounted to said frame structure for movement toward and away from said frame structure while maintaining a parallel relationship thereto, vehicle supporting shoes mounted upon said platform, fluid-actuated lifting means secured between said frame structure and said platform for moving said platform upwardly to cause said shoes to engage the undersides of a vehicle, an upright post mounted upon said frame structure and a pivotable latch plate secured to said platform, said latch plate having an aperture therethrough

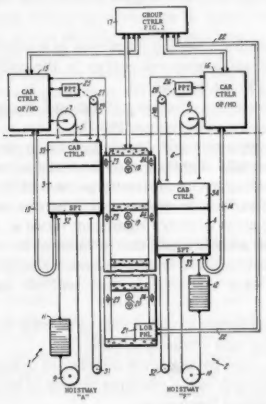
received about said post and causing the latch plate to bind on the post when it is urged to move downwardly relative to the post for preventing an elevated platform from being lowered, a fluid-actuated mechanism for pivoting the latch plate to place the aperture in alignment with the post for permitting relative movement therebetween to permit the platform to be lowered, and fluid-actuated control means for blocking the flow of fluid pressure to said means for releasing, said control means communicating with said pressure in said lifting means so that when such pressure drops below a predetermined level as would properly control the descent of the platform said control means is caused to block the flow of fluid pressure to said means for releasing.

4,323,142

DYNAMICALLY REEVALUATED ELEVATOR CALL ASSIGNMENTS

Joseph Bittar, Simsbury, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Dec. 3, 1979, Ser. No. 99,945
Int. Cl.³ B66B *1/18*
U.S. Cl. 187—29 R **7 Claims**



1. An elevator system including a group of elevators for servicing a plurality of floor landings in a building, comprising:

group controller means, including hall call means for registering calls for up and down service at each of said landings, for exchanging signals with each of said elevators, and for controlling the operation of said elevators in response to said hall call means and signals received form said elevators;

each of said elevators including a car, car motion means for providing and arresting the motion of said car, means registering for calls for service required by passengers therein, and a car controller means for providing signals indicative of conditions of said car, for controlling said car motion means to cause said car to move in a selected up or down direction and to stop in response to said signals indicative of conditions of said car and to signals received from said group controller means;

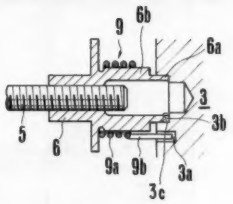
characterized by said group controller means comprising signal processing means operative, within each one of a repetitive series of cycles occurring several times per second, in response to said signals indicative of conditions of each car and to all hall calls registered at said floor landings for assigning each hall call to one of said cars in dependence on the floor landing and direction of such hall call and the conditions of each car, as indicated during the cycle in which such assignment is made, for removing from each car, after making the assignment of any hall call in any cycle, the assignment of such hall call made to such car in a previous cycle which is assigned to a different car during such cycle, and for issuing a stop command to any car at the end of any cycle in which said signals indicative of conditions of such car indicate that its committable position coincides with the landing of a hall call assigned to it.

4,323,143

AUTOMATIC GAP ADJUSTING DEVICE FOR DISC BRAKE INCORPORATING MECHANICAL BRAKE MECHANISM

Akio Negishi, Hanyu, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1979, Ser. No. 94,458
Claims priority, application Japan, Nov. 21, 1978, 53-143834; Nov. 21, 1978, 53-143835
Int. Cl.³ F16D *65/56*
U.S. Cl. 188—71.9 **2 Claims**



1. An automatic gap adjusting device for a disc incorporating a mechanical brake mechanism said device comprising in combination:

a hydraulic operating piston arranged to push a friction pad against a disc rotor;

a spindle arranged to be driven by an external force;

a sleeve nut which is disposed between said spindle and said piston and is screwed to said spindle;

a clutch spring arranged to prevent said sleeve nut from making inward screwing rotation;

a slot formed in fixed relation to said piston to extend in the axial direction of said piston, said slot being arranged to have one end of said clutch spring which extends in the direction of diameter thereof being inserted in said slot, and

a tubular sleeve guide is secured to the inside of said piston; and said slot is formed in said sleeve guide.

4,323,144

HYDRO-PNEUMATIC BRAKE ACTUATOR ARRANGED TO MAINTAIN A CONSTANT BRAKE SHOE CLEARANCE

Robert B. Morris, N. Huntingdon, and Quentin T. Clemmons, Irwin, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Jul. 16, 1980, Ser. No. 169,256
Int. Cl.³ F16D *65/54*
U.S. Cl. 188—196 A **11 Claims**

1. For use on a vehicle having a friction braking surface, a hydro-pneumatic brake actuator comprising:

(a) brake means for engaging said friction braking surface to brake said vehicle,

(b) a power actuator portion including:

(i) a bore formed in the casing of said actuator portion; and

(ii) a power piston operably connected with said brake means and coaxially disposed in said bore to form in cooperation therewith a first hydraulic chamber, said power piston being arranged to force said brake means in a brake application direction in response to the supply of fluid pressure to said first hydraulic chamber, to thereby effect engagement of said brake means with said friction braking surface;

(c) a converter portion including:

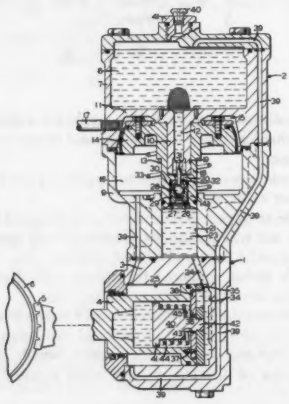
(i) a casing having formed therein a second hydraulic chamber connected to said first hydraulic chamber, a reservoir in which said hydraulic fluid is stored, and a pneumatic control chamber;

(ii) a hydro-pneumatic converter unit including:

1. a control piston operatively disposed in said control chamber for actuation from a release position to an application position in response to the supply of pneumatic pressure thereto;

2. a first return spring acting on said control piston to urge movement thereof toward said release position;

3. an input piston integral with said control piston and operatively disposed in said second hydraulic chamber, to which the fluid in said reservoir is connected, to transmit fluid pressure from said second hydraulic chamber to said first hydraulic chamber in consequence of movement of said control piston from said release position toward said application position, thereby effecting said engagement of said brake means with said friction braking surface;



wherein the improvement comprises:

(d) a second return spring to urge said power piston toward a brake release position;

(e) friction means engageable with said bore and displaceable therealong to different axial positions, for providing a stop with which said power piston is engageable to accordingly establish said brake release position thereof; and

(f) a lost-motion connection between said power piston and said friction means via which said friction means is axially displaced along said bore in said brake application direction following movement of said power piston a predetermined distance in said brake application direction, whereby subsequent movement of said power piston in said brake release direction is limited by engagement with said stop following movement of said power piston said predetermined distance, to accordingly maintain a constant clearance between said brake means and said braking surface corresponding to said predetermined distance.

4,323,145

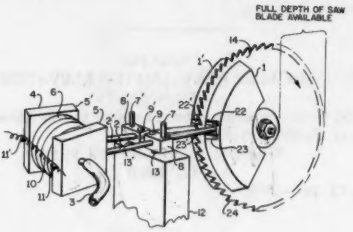
VIBRATION DAMPING METHOD AND MEANS HAVING NON-CONTACTING SOUND DAMPING MEANS

Clayton H. Allen, 651 Concord Ave., Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 738,486, Nov. 3, 1976, abandoned, and Ser. No. 899,223, Apr. 24, 1978, abandoned. This application Aug. 3, 1979, Ser. No. 63,536

Int. Cl.³ F16F *15/00*; G10K *11/02*

U.S. Cl. 188—322.11 **31 Claims**



1. Apparatus for damping vibrations in a vibrating surface having significant vibrational energy in the audio-frequency range above 100 Hz comprising,

damping means for absorbing vibrational energy in the audiofrequency range above 100 Hz,

means for supporting said damping means in close proximity to but normally slightly spaced from said vibrating surface and extending over a substantial portion of the area of said vibrating surface to embrace at least one of the highly vibrating areas of every significant mode to significantly reduce the audible sound energy radiated by said vibrating surface as compared with the audible sound energy radiated by said vibrating surface without said damping means,

said damping means having a mating member with a mating face facing said vibrating surface,

said mating face having cross dimensions comparable with the wavelength in the vibrating surface of at least some of the vibrational frequencies.

4,323,146

COASTER BRAKE HUB WITH A GEAR-TRANSMISSION

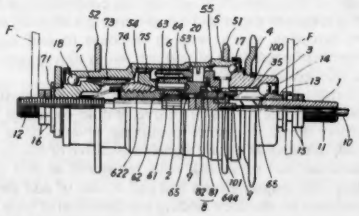
Seiji Fukui, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Division of Ser. No. 900,862, Apr. 28, 1978, Pat. No. 4,240,533. This application Jan. 14, 1980, Ser. No. 111,980

Claims priority, application Japan, May 6, 1977, 52-52284

Int. Cl.³ F16D *41/30*; F16H *5/10*

U.S. Cl. 192—6 A **1 Claim**



1. A coaster brake hub having therein a gear-transmission and a back-pedalling braking mechanism comprising:

a fixed shaft;

a driving member having a sprocket and rotatably supported to one axial end of said fixed shaft;

a brake cone rigidly fixed to the other axial end of said fixed shaft;

a hub shell rotatably supported between said driving member and said brake cone;

a multiple stage gear-transmission housed within said hub shell for changeably transmitting the forward driving force from said driving member to said hub shell when said driving member rotates in a forward direction, said gear-transmission comprising a sun gear provided on said fixed shaft, a cylindrical gear frame including a plurality of planetary gears in mesh with said sun gear and a subordinate cam means which is driven to rotate said gear frame, a ring gear including inner teeth in mesh with said planetary gears and grooves which are driven to rotate said ring gear, first transmitting members for transmitting rotating movement of said gear frame to the inner periphery of said hub shell, second transmitting members for transmitting rotating movement of said ring gear to the inner periphery of said hub shell and, means for selectively coupling the forward driving force from said driving member to one of the subordinate cam means of said gear frame and the grooves of said ring gear and comprising a cylindrical, axially movable clutch, spline coupled at one axial end to said driving member and having a prime cam means, said clutch being movable to transmit driving force from the prime cam means to one of the subordinate cam means of said gear frame and the grooves of said ring gear;

a braking mechanism housed within said hub shell comprising at least two semi-cylindrical brake shoes, actuators for radially expanding said brake shoes pressing them against the inner periphery of said hub shell, and means for supporting said actuators to said gear frame so that said actuators are operated by reverse rotation of said gear frame; and,

a change-over mechanism provided between said clutch and said gear frame, said change-over mechanism operating to forcibly intercept the force transmitting route from said driving member to said gear frame when said driving member is reversely rotated and to establish a force transmitting route from said driving member to said ring gear causing said gear frame to be reversely rotated by said ring gear, said ring gear, upon reverse rotation, operating said actuators to press said brake shoes against the inner periphery of said hub shell, said change-over mechanism comprising engaging faces provided at said prime and subordinate cam means operable upon reverse rotation of said driving member to forcibly separate said prime and subordinate cam means from driving engagement with one another such that said clutch is disengaged from driving said gear frame, said prime cam means engaging with said grooves when moved out of a range where said prime and subordinate cams are in driving engagement to cause said clutch to drivingly engage with said ring gear.

4,323,147

COIN-OPERATED DISPENSING DEVICE REFLECTING THE SELLING PRICE OF ITEMS TO BE DISPENSED

Richard Kolbl, and Bernd Mehlan, both of Herrieden, Fed. Rep. of Germany, assignors to Sielaff GmbH & Co., Fed. Rep. of Germany

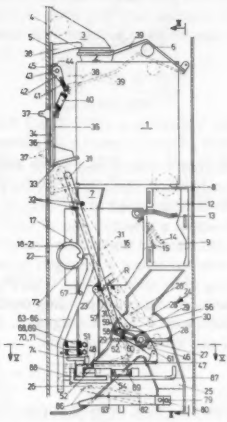
Filed Mar. 24, 1980, Ser. No. 132,766

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911634; Apr. 9, 1979, 2913432

Int. Cl.³ G07F *5/08*

U.S. Cl. 194—48 **10 Claims**

1. In a coin-operated dispensing device of the type having a plurality of counting cams which can be set to reflect the selling price of items to be dispensed and are rotated in response to the insertion of coins into the device, control rods for setting the selling price of the desired items, a dispensing device for the selected items, and a blocking rod movable from a normal blocking position to a release position permitting dispensing of the selected items in response to the insertion of coins having a value corresponding to the selected selling price, a combination comprising a plurality of movable sensing members each cooperating with one of said cams; a slide member normally holding said blocking rod in said blocking position and being movable to a disengaging position by any one of said sensing members; and a plurality of control levers each connected with one of said control rods and being pivotable thereby in front of said slide member into and out of the path of movement of a respective one of said sensing members; means for counting the inserted coins, including a sum-forming shaft; and means for rotating said cams in response to the insertion of coins, including a plurality of advancing levers,



retarding elements each associated with one of said advancing levers and each including a retarding wheel, mechanical energy-storing means coupled to at least one of said wheels, a plurality of transmissions each coupling one of said advancing levers with said sum-forming shaft and said transmissions having relative to one another respective transmission ratios corresponding to the value ratios of coins which can be accepted by said device, and means for furnishing mechanical energy to said energy-storing means for storage by the same, said energy-storing means driving and operating said wheels and levers when actuated by said coins, said coins having kinetic energy less than the amount required to drive and operate said wheels and levers, the energy required for driving and operating said levers being supplied by said energy-storing means.

4,323,148

COIN SELECTOR FOR VENDING MACHINE

Susumu Nichimoto, Tenri; Isao Shinoda, Ikoma; Shigeo Nakamura, and Haruhide Tsumura, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 5, 1980, Ser. No. 127,421

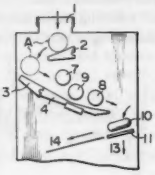
Claims priority, application Japan, Mar. 12, 1979, 54-29158; Jul. 9, 1979, 54-86770; Jul. 9, 1979, 54-86791

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A **6 Claims**

1. A coin selector apparatus, comprising a coin shape detecting sensor, a coin thickness detecting sensor and a coin material detecting sensor disposed along a coin passage along which a coin thrown-in the coin selector is moved; oscillator circuits provided for detecting shape, thickness and material of the coin, respectively, each of said oscillator circuits incorporating coil means of the associated one of said sensors for producing an output frequency signal which varies in dependence on the individual coins passing by each of said associated sensors; and

discriminator means for identifying the shape, thickness and the material of said coin by determining whether maximum values of variation in the output frequencies of said oscillators fall within respective predetermined ranges of threshold values preset for the shape, the thickness and materials of the coins authorized to be used, whereby the coin is determined as an authorized coin when affirmative results are obtained from all of said determinations, wherein the material of a coin is determined to be an authorized one when the range of coin thick-



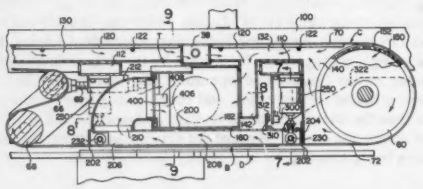
ness in which the coin is determined as the authorized one in the thickness determination coincides with the thickness range in which the coin is determined as the authorized one in the material determination, a selected one of said coin thickness sensor and said coin material sensor being so arranged that the coil gap of said selected sensor is changed in association with closing and opening of the coin passage, whereby a variation in the output frequency of the corresponding oscillator circuit is detected to produce a coin rejection signal in dependence on the magnitude of said frequency variation.

4,323,149

TRANSFER APPARATUS FOR NATURAL TOBACCO LEAVES

Robert J. Pavone, South Windsor, Conn., assignor to Gulf & Western Corporation, New York, N.Y.

Filed Mar. 13, 1980, Ser. No. 129,894
Int. Cl.[3] B65G *37/00, 17/46;* B65H *9/08*
U.S. Cl. 198—471 **17 Claims**



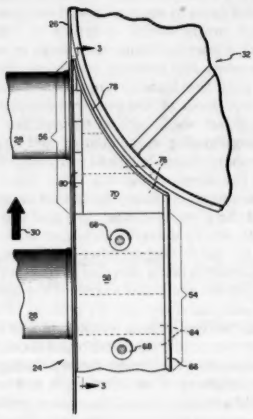
1. An apparatus for transferring a natural tobacco leaf from a continuous, flexible conveyor belt to a generally flat leaf receiving member at a preselected position in the normal path of travel of said belt, said belt having a known width, a first surface facing away from said receiving member at said preselected position, a second surface facing toward and generally parallel to said receiving member at said preselected position and a plurality of apertures forming pressure equalizing passages between said first and second surfaces, said apparatus comprising: a plenum box having a pressure opening defined by a peripheral edge of said box, said edge lying in a plane parallel to said first surface at said preselected position; means for maintaining a seal between said edge and said belt; means for creating a vacuum in said box and communicated with said opening; means for forcing said belt and box edge at said preselected position from said normal belt path in a direction toward said receiving member and into a transfer position with a leaf on said second surface lying against said receiving member, and means for creating a positive pressure in said box at said preselected position only when said second surface and a leaf thereon are forced against said receiving member.

4,323,150

MAGNETIC RAIL CONSTRUCTION

Wallace W. Mojden, Hinsdale, Ill., assignor to Fleetwood Systems, Inc., Countryside, Ill.

Filed May 2, 1980, Ser. No. 146,161
Int. Cl.[3] B65G *15/58*
U.S. Cl. 198—690 **5 Claims**



1. In a magnetic conveyor system which includes a traveling endless conveyor means having an outer surface for engaging and transporting a series of containers, a magnetic rail system including pole plates and permanent magnets disposed opposite said container-engaging surface, and a rotatable transition roll adjacent one end of said rail system and cooperating with said conveyor means in defining a directional transition zone, the combination comprising: magnetically permeable pole plate means disposed in said directional transition zone, spaced from said belt and aligned with the pole plates of said rail system generally in the direction of belt travel; permanent magnet means interjacent said pole plate means for inducing opposite polarities therein; said pole plate means proximate said transition zone having the upper surface thereof recessed with respect to said conveyor means and magnetic elements of comparatively larger magnetic moment per unit volume than said permanent magnets disposed in the space between said conveyor means and the upper surface of said pole plate means whereby to concentrate the available lines of magnetic flux in said transition zone.

4,323,151

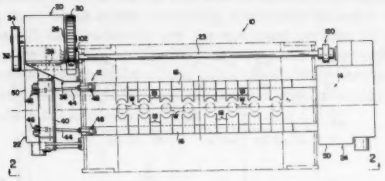
ARTICLE TRANSFER MECHANISM

Ralph L. Andrews, Hastings, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Continuation of Ser. No. 754,082, Dec. 23, 1976, abandoned.
This application May 18, 1978, Ser. No. 907,125
Int. Cl.[3] B65G *25/02*
U.S. Cl. 198—740 **13 Claims**

7. An article transfer mechanism comprising, a pair of laterally spaced apart feed bars having cooperable feed fingers therebetween, feed bar support members each supporting one of said feed bars for longitudinal reciprocation, means supporting said support members for linear reciprocation laterally toward and away from one another, means to reciprocate said feed bars longitudinally relative to said support members, means to reciprocate said support members laterally toward and away from one another including rotatable cam means

between said support members and follower means between said cam means and each support member, each said follower means interengaging said cam means and the corresponding support member for said follower means to displace said support members laterally in response to rotation of said cam means, said follower means including means biasing said support members laterally toward one another, said cam means displacing said support members laterally away from one another against said bias, pivotal cam means between said feed bars selectively operable independent of said rotatable cam means to displace said feed bars and support members laterally away from one another against said bias, and means to pivot said pivotal cam means.

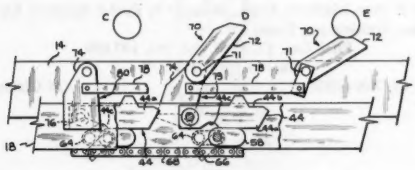


4,323,152

ACCUMULATING CONVEYOR

Douglas D. Wiknich, Davisburg, Mich., assignor to LaSalle Machine Tool, Inc., Troy, Mich.

Filed Apr. 28, 1980, Ser. No. 144,561
Int. Cl.³ B65G *25/02*
U.S. Cl. 198—751 **12 Claims**



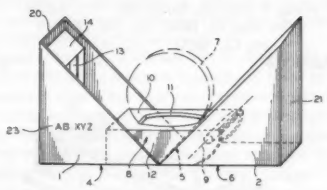
1. An accumulating conveyor comprising an elongated support along which a plurality of articles are movable through a series of longitudinally spaced apart stations, a transfer bar mounted for reciprocal movement longitudinally of said elongated support, and for up and down reciprocal movement relative to said elongated support, a plurality of independently movable feed members on said transfer bar movable between idle and feed positions, means for moving said transfer bar up and down and for reciprocating said transfer bar back and forth through a work transfer cycle commencing with the transfer bar in a start position for moving said feed members from one station to the next adjacent station to advance workpieces on said elongated support to fill any empty stations, a plurality of feed member setting units on said transfer bar operatively associated with said feed members and movable between rest and operative positions, each of said feed member setting units being operable when moved to the operative position to move an associated one of said feed members to the feed position, each of said feed member setting units comprising a cam member, a follower member and means pivotally mounting said cam and follower members on said transfer bar for simultaneous movement to the operative position, connecting means connecting adjacent ones of said feed member setting units, and sensing means at each station for sensing the absence of an article, each of said sensing means being operatively associated with a corresponding feed member setting unit that is associated with the feed member at the next following station, said sensing means at an empty station causing the movement of a corresponding feed member setting unit to the operative position upon initial upward movement of said transfer bar from a start position to move the feed member at the station next following said empty station to the feed position, said connecting means acting in response to the movement of said corresponding feed member setting unit to the operative position to move all feed member setting units behind said corresponding feed member setting unit to operative positions to move all feed members associated therewith to feed positions, each of said sensing means comprising an actuator member movable between an inoperative position when an article is located at a corresponding station and an actuating position when said corresponding station is empty, said follower member of one of said feed member setting units engaging an associated actuator member in the actuating position thereof upon upward movement of said transfer bar thereby pivoting said follower member to pivot said cam member into engagement with an associated feed member to move said feed member to the feed position.

4,323,153

DISPLAY CASE FOR A LUXURY ARTICLE

Gerard C. L. Courtin, 43, Avenue George V, 75008 Paris, France

Filed Jul. 30, 1979, Ser. No. 61,889
Claims priority, application France, Jul. 31, 1978, 78 22643
Int. Cl.³ B65D *5/50, 85/00*; A47B *88/04*
U.S. Cl. 206—45.13 **9 Claims**



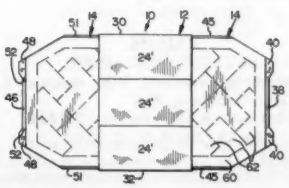
1. Display case, particularly for luxury articles, such as a perfume bottle, jewel, or lighter, which comprises: two parts integral with one another, the one called "immobile" comprising a plane base acting as a support for the case when closed and the other being mobile in relation to the first; a support used for displaying the article mounted on the inside of the case being articulated on said mobile part and able, during movement of this mobile part, to slide in the first part, approximately in horizontal translation, so as to remove said support from the first part of the case and expose it to view between the two parts of the case.

4,323,154

FOLDED BOX WITH PUZZLE

Carl Brandenfels, Rte. 1, Box 1208, St. Helens, Oreg. 97051

Filed Mar. 3, 1980, Ser. No. 126,555
Int. Cl.³ B65D *77/00, 69/00*
U.S. Cl. 206—216 **1 Claim**



1. A novelty item comprising:

(a) a prepared blank for a box having a plurality of side panels, said prepared blank including:

(1) a flat sheet having a medial portion, said medial portion having a pair of opposed edges and defining a portion of the side panels of said box;

(2) a first end portion of said sheet, attached to said medial portion and defining a top member of said box;

(3) a second end portion of said sheet, attached to said medial portion and defining a bottom member of said box;

(4) flap means, defining the remainder of the side panels of said box, connected to said medial portion along one of said opposed edges, said flap being connected with the other of said opposed edges so as to overlie said portion of the side panels, said flap means and said medial portion together defining a passageway therebetween;

(b) a card extending through said passageway, said card having generally the same shape as said prepared blank and being no larger than said prepared blank;

(c) wherein said prepared blank and said card each have a generally octagonal shape, including a first pair of parallel sides, a second pair of parallel sides approximately perpendicular to said first pair of parallel sides, and four oblique sides interconnecting mutually perpendicular ones of said first and second pairs of parallel sides.

4,323,155

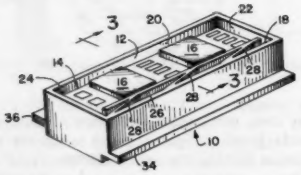
INTEGRATED CIRCUIT CARRIER

Jarrett B. Kling, 8 Oak La., Rochester, N.Y. 14610

Filed Jan. 21, 1980, Ser. No. 113,918

Int. Cl.³ B65D *73/02, 85/42*

U.S. Cl. 206—328 **6 Claims**



1. A carrier for an integrated circuit package of rectilinear shape which comprises a housing having a generally rectilinear opening extending between opposite ends thereof for receiving said package when inserted into said opening from one of said ends thereof, said housing having first and second pairs of walls facing each other which defines said opening, at least one plate in said opening adjacent one of said first pair of walls and facing the other of said first pair of walls which narrows the distance across said opening between that first pair of walls, means providing a resilient mounting for said plate on said one of said first pair of walls which applies forces via said plate which tend to clamp and retain said package in said housing, at least said one plate and at least one of said first pair of walls being closer to each other at said one of said ends of said opening then at the other end of said opening to define a tapered receptacle for said package.

4,323,156

BATTERY CONTAINER

Bevan E. Grueneberg, Cedarburg, Wis., assignor to Pioneer Container Corp., Cedarburg, Wis.

Filed Jun. 15, 1981, Ser. No. 273,542

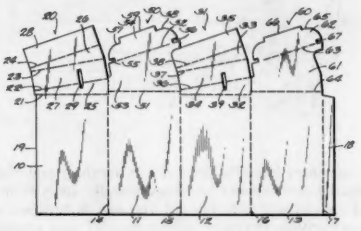
Int. Cl.³ B65D *73/02, 85/68*

U.S. Cl. 206—333 **5 Claims**

1. A storage battery container formed of paper material and comprising:

integral pairs of side walls and end walls that form the body of the container,

the side walls each having an integral flap extending from a horizontal score line that determines the top edge of the wall, said flaps each having other score lines that are at an angle relative to the horizontal score line to thereby define a first triangular section, a first rectangular section, a second triangular section and a second rectangular section, said sections being foldable on the score lines to dispose the first triangular section horizontally, the first rectangular section vertically, the second triangular section horizontally and congruent to the first triangular section, and the second rectangular section vertically and at an angle relative to the first rectangular section to thereby form tapered hollow beams for bearing on opposite sides of the top of a battery case to prevent a load imposed on the battery from being transmitted to components of the battery which extend above its top.



4,323,157

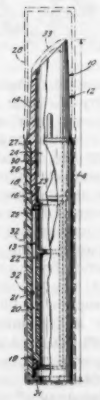
BOTTOM-FILLABLE LIPSTICK OR THE LIKE CONTAINER

Eric J. Idec, Madison, Conn., assignor to Eyelet Specialty Co., Inc., Wallingford, Conn.

Filed Oct. 17, 1980, Ser. No. 197,809

Int. Cl.³ B65D *85/72*

U.S. Cl. 206—385 **14 Claims**



1. A bottom-fillable lipstick or the like container, comprising inner and outer elongate relatively rotatable tubular members extending between a lower base end and an upper dispensing end, said members having interengaging means retaining an axially overlapping relation of said members, said inner member having a tubular upper end which extends upwardly beyond the upper end of said outer member for manual actuating grasp and which defines the dispensing end of the container, an elongate tubular carrier member slidable within said inner tubular member and having radially outward cam-follower means at its lower end, said carrier member having internal

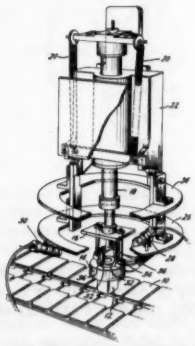
pomade-supporting platform means near its upper end, cam formations including (a) an elongate slot in said inner tubular member and of longitudinal extent such that said carrier fully covers the upper end of said slot when said cam follower is at its lowermost position in said slot and (b) internal threads in said outer tubular member and engaged to said cam follower, said platform means and the base ends of said tubular members being open to an extent permitting removable insertion of a bottom-fill tube, whereby for the retracted position of said carrier member, the volume defined within the upper ends of said carrier member and of said inner tubular member can be bottom-filled with tube-extruded pomade without danger of pomade entry into said slot.

4,323,158

BOTTLE NECK FINISH INSPECTION APPARATUS

Frank H. Wheaton, III, Millville, and Curtis C. Houghton, Elmer, both of N.J., assignors to Wheaton Industries, Millville, N.J.

Filed Jul. 3, 1980, Ser. No. 165,623
Int. Cl.³ B07C 5/342
U.S. Cl. 209—524 8 Claims



1. In an apparatus for detecting defects in the neck portion of each bottle in a succession of glass bottles delivered to a bottle test location, said apparatus including:

means for receiving, holding and rotating each of said bottles as it is delivered to said test location,

optical illumination and detecting means focused at one point on the neck of a bottle retained at said test location for detecting defects therein as said bottle is rotated and

means responsive to a defect signal output from said illuminating and detecting to reject the bottle then retained at said test location,

the improvement wherein said bottle receiving, holding and rotating means comprises:

an annular bottle gripping member adapted to fit around and to grip the neck finish of a bottle to be checked,

means for lowering said annular gripping member from a raised position to a lowered position in which it is adapted to engage a bottle disposed in said bottle test location,

means for rotating said annular gripping means in said lowered position, and

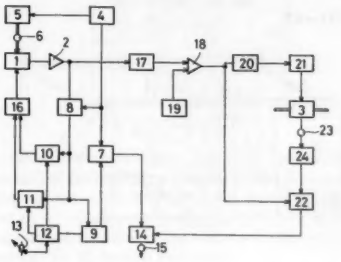
means for raising said gripping member back to said raised position.

4,323,159

MONITORING LIGHT SENSITIVE ELECTRONIC COMPONENTS

Peter Wolf, Edenvale, South Africa, assignor to Gunson S.A. (Proprietary) Limited, Johannesburg, South Africa

Filed Oct. 30, 1979, Ser. No. 89,363
Claims priority, application South Africa, Oct. 31, 1978, 78/6121
Int. Cl.³ B07C 5/342
U.S. Cl. 209—548 12 Claims



1. Apparatus for monitoring a light sensitive electronic detector component used with a device for detecting light pulses of a specified character comprising:

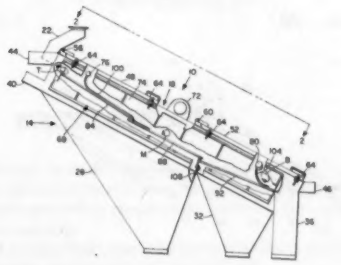
a light source having means adapted to direct light at a light sensitive electronic detector component, the source being operatively connected to a pulse generator which is also connected to set an alarm monitor and to operate a switch which has its input connected to the detector component and its output connected to a voltage sensitive device for resetting the alarm monitor if a signal received from the switch is above a predetermined minimum voltage and the alarm monitor being adapted to activate an attention drawing device if not reset.

4,323,160

USE OF A VIBRATING SCREEN TO SEPARATE SMALL LIVE INSECTS FROM AGRICULTURAL COMMODITIES

Ronald H. Cowgill, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 30, 1980, Ser. No. 145,285
Int. Cl.³ B07C 5/04
U.S. Cl. 209—632 10 Claims



1. A method for separating substantially all small live insects from an agricultural commodity having a size similar to that of green coffee beans, said method comprising the steps of:

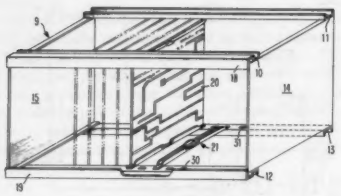
(a) placing the commodity on a screen having an insect separating portion provided with a multiplicity of apertures sized smaller than the commodity but larger than the small insects; and

(b) vibrating the screen at a frequency of at least about 60

cycles per second, and an amplitude of from about 1/64 to ¼ inches to separate the small insects, the frequency and amplitude being selected to avoid excessive bouncing of said commodity.

4,323,161
PRINTED CIRCUIT CARD RETAINER AND RACK ASSEMBLY

Joseph Marconi, 428 S. Jensen Rd., Vestal, N.Y. 13850
Filed Dec. 22, 1978, Ser. No. 972,242
Int. Cl.³ H02B 1/02
U.S. Cl. 211—41 **1 Claim**



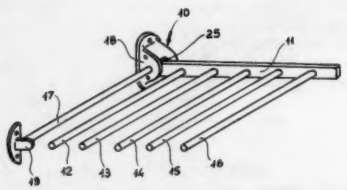
1. A retaining guide for a printed circuit card, said retaining guide extending horizontally between, and being supported by spaced parallel support members of a generally oblong frame, said retaining guide comprising:

a resilient arcuate channel member having a flat bottom and upstanding thin side walls, ends of said bottom extending as lips which engage said parallel support members to support said retaining guide in said frame while allowing said retaining guide to flex in the vertical direction; and

a saddle shaped flared out alteration of said channel member generally at the center of said channel member, said saddle shaped flared out portion of said channel member decreasing the height of said side walls and correspondingly increasing the width of said bottom to thereby increase the stiffness of said retaining guide against bending in the horizontal direction while increasing the flexibility of said retaining guide in the vertical direction.

4,323,162
MULTIPLE-TROUSER-HANGER

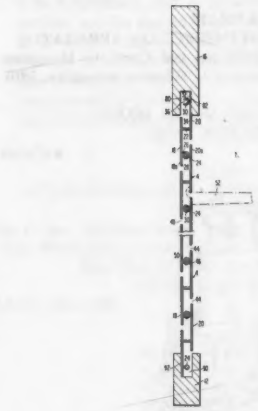
Jiri Steinhilber, P/zza Duoma, 20 Milano, Italy
Filed Aug. 20, 1979, Ser. No. 68,055
Claims priority, application Italy, Sep. 11, 1978, 27500 A/78; Sep. 28, 1978, 28084 A/78
Int. Cl.³ A47F 7/19
U.S. Cl. 211—100 **7 Claims**



1. A household trouser-hanger comprising a plurality of parallel horizontal elongated hanging bars; a supporting arm connected to said bars and disposed normally to said elongated bars; a joint connected to said arm and adapted to pivotally support said arm at one of said bars at one end thereof; and a wall-mountable bracket arranged to receive said joint and having a substantially cylindrical chamber and an outwardly extending horizontal pin, said joint including a cylindrical member and a disc coaxially mounted on said pin and disposed within said chamber, said disc being formed with a cut and said cylindrical member having a longitudinal slot at an outer surface thereof, a pawl supported on said bracket and a spring arranged to press said pawl against said cylindrical member and said disc; said joint being pivotally movable on said pin within said chamber due to a swivelling movement of said supporting arm between a vertical position in which said arm is held vertically downwards by gravity and a horizontal position in which said pawl is arrested within said slot of said member and pressed against said cut of said disc to thereby provide two terminal self-locking positions of the trouser-hanger for hanging over and taking off several pairs of trousers.

4,323,163
ARTICLE DISPLAY UNITS AND MEMBERS FOR FORMING THEM

Robert L. Johns, 927 Azalea La., Vero Beach, Fla. 32960
Filed Mar. 12, 1980, Ser. No. 129,686
Int. Cl.³ A47F 7/14; E04C 1/10, 1/30
U.S. Cl. 211—189 **8 Claims**



1. A member for use in forming an article display panel containing a plurality of parallel slots in an exterior surface thereof by interlocking together a plurality of said members which comprises:

a first rectangular web having a length substantially greater than its width defined by a first pair of longitudinal edges and a first pair of substantially shorter transverse edges,

a second rectangular web of size and shape substantially equal to said first rectangular web defined by a second pair of longitudinal edges and a second pair of substantially shorter transverse edges,

a longitudinally elongated columnar element fixed to said first web at a position remote from said first longitudinal edges by a short, integral, dependent leg,

a longitudinally, elongated tubular element fixed to said second web substantially parallel to said columnar element at a position remote from said second longitudinal edges by a short, integral, dependent leg,

a longitudinal slot in said tubular element along the entire length thereof diametrically opposed to said leg thereof, the width of said slot being less than the width of said columnar element,

said first and second webs being spaced apart parallel to each other with only a minor portion of said first web overlapping an equivalent portion of said second web, and

a third web integral with said first and second webs and perpendicular thereto fixing said first and second webs in said spaced apart parallel position,

said columnar element depending from said first web toward said second web, and

said tubular element depending from said second web toward said first web,

said columnar element and said tubular element being spaced apart from each other a distance such that when a plurality of said members are interlocked into a panel by having columnar elements of said members enveloped by tubular elements of adjacent members, adjacent longitudinal edges of said members are spaced apart forming parallel slots in both exterior surfaces of said panel.

4,323,164

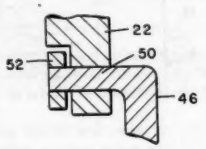
LOCKING SYSTEM FOR A TRAIN CAR COUPLER

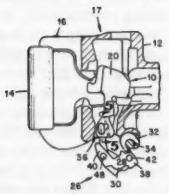
Ben E. Sutherland, Rte. 2, Cherokee Dr., Seymour, Tenn. 37865

Filed Feb. 19, 1980, Ser. No. 122,580

Int. Cl.³ B61G *3/06*

U.S. Cl. 213—145 **6 Claims**





1. In a locking system for a railway car coupler including a gravity lock member defining a slot and locklifter means including a trunnion extending through said slot and terminating at a distal end, said trunnion being freely pivotable within said slot the improvement comprising elongated flange means centrally secured to said trunnion at said distal end, said flange means preventing withdrawal of said trunnion from said slot unless a predetermined orientation therebetween is achieved, said predetermined orientation being achievable only when said coupler is in a partially dismantled condition.

4,323,165

BOTTLE CLOSURE

Heinz H. Weick, Geneva, Switzerland, assignor to Herkules AG, Menziken, Switzerland

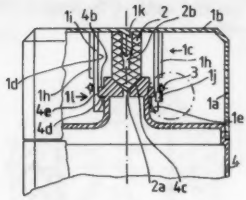
Filed Jul. 2, 1980, Ser. No. 165,288

Claims priority, application Switzerland, Jul. 6, 1979, 6323/79; Nov. 28, 1979, 10560/79

Int. Cl.³ B65D *41/30*

U.S. Cl. 215—320 **9 Claims**

1. A bottle closure comprising a closure cap which can be pushed onto a bottle, comprising a bowl-shaped main body of any configuration in plan, to the inside of the end portion of which there is secured at an approximately central position a rubber-elastic member which serves for sealingly bearing against the edge of the mouth of the bottle, and further comprising a plurality of resilient blade portions which are formed on the inside of the end portion of the cap and which concentrically surround the rubber-elastic member in the manner of a longitudinally slotted hollow cylinder, which blade portions have detent portions formed thereon on the inside thereof in the region of their free ends, for resiliently engaging below an annular projection on the neck of a bottle, characterised in that the sealing member (**2**) is in the form of a peg-like member which in the closure condition bears sealingly with its free end surface (**2*a***) against the end edge (**4*c***) of the mouth of the bottle, the length of the peg-like member corresponding at least to half the distance measured in the longitudinal direction



thereof between the end portion (**1*b***) of the cap and the detent surfaces (**1*n***) of the projecting detent portions (**1*e***), and that the free end regions of the resilient blade portions (**1*d***) are surrounded by a resilient ring (**3**) which is retained in position in the longitudinal direction of the blade portions, on both sides, by portions (**1*h*, 1*j***) formed thereon.

4,323,166

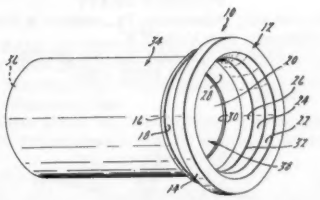
FILLER PIPE SEAL WITH FILL CONTROL SKIRT

Bruce J. Maeroff, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 9, 1979, Ser. No. 83,013

Int. Cl.³ B65D *25/20*

U.S. Cl. 220—86 R **6 Claims**



1. A fuel tank filler pipe seal comprising;

a resilient deformable annular body for use between a fuel tank and a filler pipe intruding into said fuel tank through an opening;

said annular body coaxially mountable about said filler pipe within said opening of said fuel tank;

means on said annular body for making a seal between said pipe and fuel tank;

a downwardly depending tubular skirt portion of predetermined length extendable into said tank with a lower end of said skirt extendable below the end of said filler pipe such that said lower end of said skirt controls the amount of fuel into said fuel tank before said filler pipe becomes filled with said fuel.

4,323,167

INSULATING CONTAINER FOR COOKING FOOD

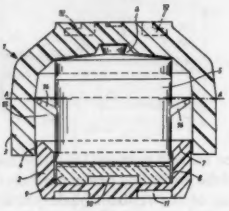
Rudolf F. Zirn, Franz-von-Ried-Str. 6/VII, 8960 Kempten, Allg., and Erich Karlsen, Untere Eberhalde 70A, 8992 Wasserburg, both of Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 102,155

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2940346

Int. Cl.[3] A47J *36/36;* B65D *25/28*

U.S. Cl. 220—408 6 Claims



1. An insulating container assembly for holding a pot containing cooking food, which comprises;

a tubular cover made from a thermally insulating material and having a first closed end, a second open end and a bore communicating between the ends;

a tubular insert made from a thermally insulating material and having a first open end, a second closed end and a bore communicating between the ends thereof;

said insert having a smaller outer diameter than the diameter of the bore of said cover whereby when a cooking pot is received in the bore of the insert and the first open end of the insert is inserted into the second open end of the cover until the cover seats on the pot, a slot is formed between the open end of the insert and the open end of the cover; said slot communicating between the bore of the cover and outside of the container; at a point on the open end of the tubular container and below the open end of the insert;

said bores being adapted by size and configuration to receive a cooking pot.

4,323,168

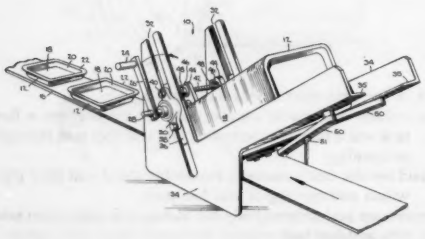
METHOD AND APPARATUS FOR DISPENSING FLEXIBLE TRAYS

Kevin M. Callahan, Philadelphia, Pa., assignor to International Paper Company, New York, N.Y.

Filed Jun. 13, 1980, Ser. No. 159,239

Int. Cl.[3] B65H *3/00*

U.S. Cl. 221—42 9 Claims



1. Apparatus for dispensing trays one at a time from the bottom of a nested stack of flexible, flanged trays, each tray having a sidewall, said apparatus comprising:

(a) first and second supports spaced at a distance less than the length of the bottommost tray in the stack to permit the flange of that tray to rest on the supports and support the stack;

(b) means to compress the bottommost tray lengthwise sufficiently by pushing on its sidewall so that the tray can pass downwardly between the supports; and

(c) means to impart a downward movement to the bottommost tray.

4,323,169

DISPENSER FOR DISPENSING FROZEN GOODS

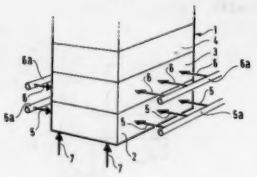
Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France

Filed Jan. 22, 1980, Ser. No. 114,218

Claims priority, application France, Jan. 29, 1979, 79 02199

Int. Cl.[3] B65G *59/06*

U.S. Cl. 221—124 24 Claims



1. Apparatus for dispensing a package of frozen goods from one end of an aligned plurality of contiguous packages maintained in a below freezing environment, the apparatus including means for releasably grasping a package next adjacent to the package at one end of such an aligned plurality of packages, means for separating said end package from the next adjacent package by applying a force against at least one side of the end package while said grasping means is actuated, means for supporting said grasping means and said separating means to permit selective engagement and disengagement thereof with the corresponding packages, and means for selectively actuating said grasping means and said separating means to engage the corresponding packages, wherein the improvement comprises:

said grasping means and said separating means having resiliently deformable contact surfaces for directly contacting said next adjacent package and said end package, respectively, and means for deforming said contact surfaces convexly toward the respective packages by an amount sufficient, when said grasping means and said separating means are actuated, to break away any ice which may have formed on said surfaces between dispensing operations, whereby the packages will not adhere to said contacting surfaces during a dispensing operation.

4,323,170

CLEANING MATERIAL SUPPLYING APPARATUS WITH CLEANING MATERIAL STORING VESSEL CONTROLLED BY LID POSITION

Yoshio Ikeda, Aichiken, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 4, 1980, Ser. No. 156,346

Claims priority, application Japan, Jun. 26, 1979, 54-080494; Sep. 10, 1979, 54-115869

Int. Cl.[3] B67D *5/08*

U.S. Cl. 222—70 8 Claims

1. An apparatus for dispensing cleaning material into a washing apparatus comprising:

a housing having an opening for receiving cleaning material;

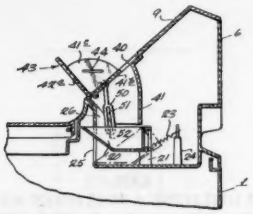
a vessel mounted in said housing for receiving and storing cleaning material passing through said opening;

means for pivotably mounting said vessel for movement between a horizontal position storing said material and a dispensing position in which material in said vessel is dispensed;

resilient means connected to said vessel for urging said vessel toward said dispensing position;

latch means engagable with said vessel for maintaining said vessel in said horizontal position when engaged with said vessel;

means for releasing said latch means during operation of said washing apparatus so that said vessel moves into said dispensing position;



lid means pivotably mounted on said housing for movement between a closed position closing said opening and an open position in which said material can be placed in said opening; and

means connecting said lid and vessel for returning said vessel to said horizontal position when said lid is moved to said open position.

4,323,171

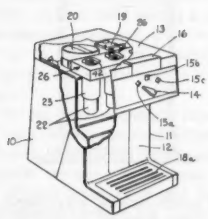
BEVERAGE DISPENSING DEVICE AND CONTAINER THEREFOR

Robert B. Whorton, III, Spartanburg, S.C.; Samuel C. Crosby, Jr., Decatur, Ga.; Frank M. Iannelli, Spartanburg, S.C.; James Denmark, Ilkley, and Edward L. Jeans, Hereford, both of England, assignors to Tannetics, Inc., Erie, Pa.

Filed Jul. 2, 1979, Ser. No. 54,304

Int. Cl.³ B67D *5/54, 5/56*

U.S. Cl. 222—82 **9 Claims**



1. Carbonated liquid dispensing apparatus of the type which includes a liquid container, a rigid receptacle to removably receive the liquid container, and a piercing device carried by said receptacle for piercing said liquid container when inserted in said receptacle in an operating position, said apparatus comprising:

an outwardly protruding profiled lobe portion carried by said liquid container;

said lobe portion having a penetratable wall portion;

a hollow cavity portion defined within the interior of said profiled lobe for accommodating said piercing device;

arcuate guide means formed in said receptacle for receiving said lobe portion and guiding said lobe portion to said piercing device as said lobe is rotated therein;

opening means formed in said receptacle accommodating the shape of said profiled lobe portion affording access of said lobe portion to said arcuate guide means;

whereby said liquid container may be received in said receptacle and rotated to cause said lobe portion to be guided and pierced by said piercing device and be properly connected in said operating position.

4,323,172

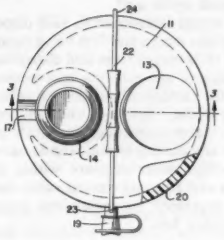
LIQUID CONTAINER WITH CUP HOLDER

Ho S. Lim, 4109 Metzerott Rd., College Park, Md. 20740

Filed Jan. 21, 1980, Ser. No. 114,130

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—130 **6 Claims**



1. A liquid container for carrying of liquid having a supply of cups therewith comprising

a walled container having a liquid holding compartment positioned with the center of gravity of liquid therein off-center from the center axis of said walled container.

a closable opening extending into said liquid holding compartment,

a well within the periphery of said walled container but outside of said liquid holding compartment for holding the supply of cups in nested relationship,

a closable spout near the bottom of said walled container connected into said liquid holding compartment,

carrying means to adjust for changes in the distribution of the weight of the volume of liquid and cups in said container for ease of carrying said container with at least one end of said carrying means being selectively engagable in horizontal positions to said walled container,

and a downwardly extending finger slot in a wall of said well extending substantially from the top to the bottom of said well.

4,323,173

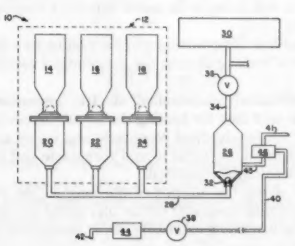
BEVERAGE DISPENSER PUMPING SYSTEM TO MAINTAIN LIVE PRESSURE AFTER SHUT OFF

Joseph W. Shannon, Kent, Ohio, assignor to American Beverage Control, Mogadore, Ohio

Continuation of Ser. No. 742,693, Nov. 17, 1976, Pat. No. 4,274,557. This application Feb. 19, 1981, Ser. No. 235,589

Int. Cl.³ B67D *5/56*

U.S. Cl. 222—136 **5 Claims**



1. A beverage dispenser pumping system for dispensing

beverages from their original containers and out of a pouring head, comprising:

an elastic dispensing line connected at one end thereof with the pouring head;

pump means connected to said dispensing line at another end thereof for receiving and forcing the beverages toward the pouring head under pressure;

first valve means interposed in said dispensing line at the pouring head for enabling the flow of the beverages from the pouring head when open at the beginning of the dispensing cylce and prohibiting such flow when closed at the end of such cycle; and

second valve means interposed in said dispensing line between said pump means and first valve means for prohibiting the flow of beverage from said dispensing line and into said pump means, and wherein said second valve means closes after the closing of said first valve means following a dispensing cycle, closing of said first valve means expanding said elastic dispensing line under pressure of said pump means and closing of said second valve means maintaining beverage under pressure within said dispensing line between said first and second valve means, said pressure being generated by maintained expansion of said elastic dispensing line.

4,323,174

APPARATUS FOR DISPENSING MASTIC MATERIAL

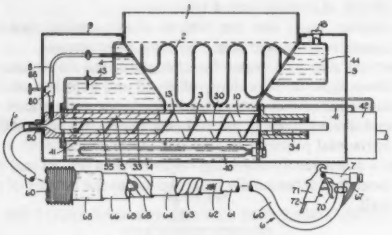
Thomas J. Wood, 25, Chalfont Close, Bedworth, Near Nuneaton, Warwickshire, England

Filed Oct. 6, 1980, Ser. No. 194,392

Claims priority, application United Kingdom, Oct. 11, 1979, 35379/79

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—146 H **8 Claims**



1. Apparatus for dispensing mastic material comprising;

(a) a longitudinal receptacle for receiving mastic material;

(b) a hopper coupled to said longitudinal receptacle for receiving cold mastic material in block or granular form;

(c) a barrel having a bore communicating at one end with said longitudinal receptacle and providing an outlet therefrom at its other end;

(d) heating means in said hopper for initially softening cold mastic material in the hopper for gravity flow of the softened mastic material down into said longitudinal receptacle;

(e) a closed tank for containing a heat conductive liquid such as oil and housing at least the longitudinal receptacle and barrel;

(f) thermostatically controlled electric immersion heater means in said tank for heating the liquid therein for in turn heating the longitudinal receptacle and barrel in order to maintain mastic material in said receptacle and barrel in a required softened condition;

(g) a shaft along the interior of the longitudinal receptable and extending co-axially within and along the barrel, said shaft also extending exteriorly of the receptacle for driven rotation;

(h) a feed screw carried fast about the shaft in said receptacle for feeding softened mastic material therein to the barrel, a reduced diameter co-axial continuation of the feed screw having a close working fit in the bore of the barrel and being of corresponding bore size for forced feed of the softened mastic material along the bore and pressurized discharge thereof at the outlet end of said bore.

4,323,175

DISPENSER UTILIZING A FOLLOWER AND DELIVERY DEVICE FOR DISPENSING PASTES, CREAMS, ETC.

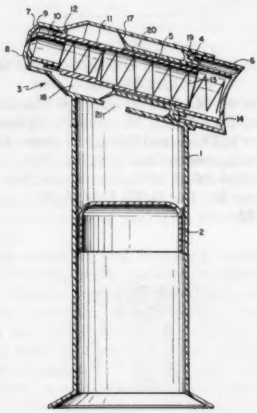
Josef Eckert, Suhlestrasse 69, D-8744 Mellrichstadt, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,052

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2916206

Int. Cl.³ G01F *11/00*

U.S. Cl. 222—256 **9 Claims**



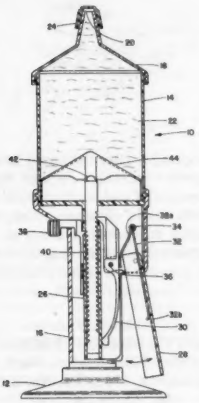
1. Dispenser for cream, sauces, jelly, pastes, syrups or the like comprising a main cylinder having an intake passage through the wall thereof and continuously communicating with a container, and an outlet opening in the forward end thereof, the rearward end being open; a guide cylinder disposed within said main cylinder and being coaxial therewith; an annular cylinder space defined by the inner wall of said main cylinder and the outer wall of said guide cylinder; a displacement piston slidingly supported by said guide cylinder and having a packing seal at the forward end and a sealing ring at the rearward end, said packing seal and sealing ring contacting said inner wall of said main cylinder, said packing seal thereby dividing said cylinder space into a rear feed space communicating with said intake passage, and a forward delivery space communicating with said outlet opening; actuating means slidingly disposed in said open end of said main cylinder and in operating engagement with said piston; closure means juxtaposed with said outlet opening and arranged for sliding movement in said guide cylinder; and means normally biasing said closure means against said outlet opening and said actuating means in its rearmost position.

4,323,176

MANUALLY-OPERABLE RATCHET TYPE DISPENSER FOR COMESTIBLES

John R. Sartain, Irvine, Calif., assignor to Taco Bell, Irvine, Calif.

Filed Jul. 11, 1980, Ser. No. 168,060
Int. Cl.[3] B65D *88/54*
U.S. Cl. 222—326 4 Claims



1. An apparatus for discretely dispensing predetermined quantities of a comestible comprising:

a. a container having an open bottom and a quantity of comestible disposed therein; said container having a dispensing orifice; a piston head having a substantially conical shape positioned along the open bottom of said container in order to retain the comestible within the container; a means for moving said piston head upwardly into the container;

b. a casing having said container removably mounted thereon; a frame slidably received within said casing, said frame positioned immediately below said piston head to provide support therefor, an elongate ratchet member axially and slidably arranged in said frame; said ratchet extending upwardly through the frame so as to contact said piston head; and

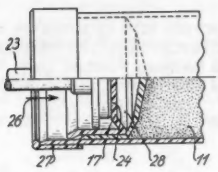
c. an actuating means comprising a flexible pawl connected to said ratchet; a handle pivotally connected to said casing, said pivotal connection including a pin and a spring means positioned between and interconnecting said handle and said pawl so as to enable the movement of the handle to flex the flexible pawl whereby upon such flexing the pawl incrementally advances said ratchet member towards the piston head and displaces the head upwardly into the container so as to dispense a quantity of comestible corresponding to the displaced volume in said container, said frame having a latch means, said latch means comprising a pawl having a tab extending from within the casing, said pawl being attached to pegs extending from said frame, said pawl being positioned on the opposite side of the ratchet relative to said handle, said pawl having a tooth which engages said ratchet on the opposite side that the flexible pawl engages the ratchet to restrain the ratchet from movement away from the container.

4,323,177

PISTON FOR EJECTING A VISCOUS OR PLASTIC MASS

Ole S. M. Nielsen, Bakkefaldet 36, DK.2840 Holte, Denmark

PCT No. PCT/DK79/00009, § 371 Date Nov. 14, 1979, § 102(e) Date Nov. 13, 1979, PCT Pub. No. WO79/00758, PCT Pub. Date Oct. 4, 1979
PCT Filed Mar. 13, 1979, Ser. No. 190,324
Claims priority, application Denmark, Mar. 14, 1978, 1149/78
Int. Cl.[3] B67D *5/46*
U.S. Cl. 222—386 6 Claims



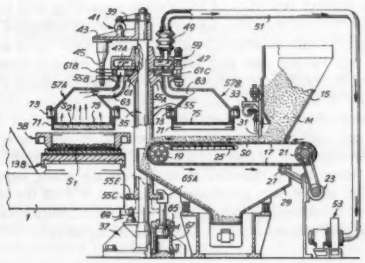
1. A piston assembly for ejecting a viscous or plastic mass from a cylindrical dispensing container, said assembly comprising a piston member having an open end, a peripheral skirt and being closed on the other end by a piston top arched in a direction away from said open end, a separate piston actuating member received within said piston member skirt and engaging with the periphery of said piston top, said actuating member including a transverse wall portion which is arched in a direction opposite to that of said piston top, said piston top being deformable whereby when inserted into said container under the influence of an inwardly directed axial force applied to the central part thereof its effective diameter is reduced to allow trapped air to pass between said skirt and the container wall, and whereby the effective diameter will increase to seal the skirt against the container wall when axial force is applied to the periphery of said piston top by said actuating member.

4,323,178

APPARATUS TO PROVIDE AN EVEN LAYER OR LOOSE MATERIAL TO A SUCTION CONVEYOR

Alfredo Longinotti, Florence, Italy, assignor to Centro Di Ricera Enrico Longinotti Firenze S.p.A., Italy

Filed Dec. 14, 1979, Ser. No. 103,504
Claims priority, application Italy, Dec. 21, 1978, 9675 A/78
Int. Cl.[3] G01F *11/18*
U.S. Cl. 222—415 7 Claims



1. An apparatus for supplying loose material for preparing tile-size dosages of the material comprising, a conveyor for receiving a continuous layer of the loose material, loose material supply means associated with said conveyor for supplying a continuous layer of loose material to said conveyor, first drive means connected to said conveyor for intermittently driving said conveyor for intermittently moving the layer into a drawing position, at least one material drawing bell having a

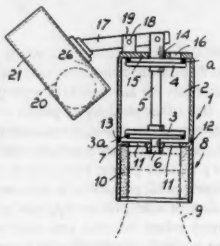
porous diaphragm and a peripheral edge extending outwardly therefrom for receiving a tile-size dosage of the material, second drive means connected to said material drawing bell for moving said bell toward said conveyor to receive a tile-size dosage of the material from the continuous layer of loose material on the conveyor when said conveyor is not being driven, and suction means connected to said material drawing bell for establishing an underpressure in the bell to support the tile-size dosage of material against the porous diaphragm, said conveyor comprising an endless belt conveyor.

4,323,179

METERING DEVICE FOR LIQUIDS, IN PARTICULAR ALCOHOLIC LIQUORS OR SPIRITS

Carlo Crespi, Via Bertinoro, 9-Milano, Italy

Filed May 14, 1980, Ser. No. 149,806
Int. Cl.³ G01F *11/28*
U.S. Cl. 222—449 **6 Claims**



1. An automatic metering device for liquids, in particular alcoholic liquors, for application to a liquid container, comprising a metering chamber, means for sealingly attaching the device to said liquid container, at least one inlet opening and at least one delivery opening at opposite ends of said metering chamber, rigidly interconnected valve means for alternately shutting off said openings, gravity-operated control means associated with said valve means and effective to hold said valve means in a first position where said metering chamber is in communication with said liquid container and shut to the outside environment when said liquid container is standing upright or inclined to a predetermined inclined position where the bottom of said liquid container is at a higher level than said openings, and to suddenly bring said valve means to a second position where said metering chamber is separated from said liquid container and open to the outside environment upon said liquid container reaching an inclination exceeding said predetermined inclined position, wherein said gravity-operated control means comprise a stem interconnecting said valve means axially and having one end projecting out of said metering chamber in sealed relationship therewith and arranged in the proximity of said at least one delivery opening, and a control lever journalled to the metering device, said control lever having one end pivotally connected to said projecting end of said stem and another end supporting at least one weight, said control lever being movable in an oscillation plane between two stable equilibrium positions in accordance with the orientation of the metering device, said positions corresponding to said first and second position of the metering device.

4,323,180

CAMERA SHOULDER CASE

Conrad B. Sloop, 9092 Bermuda Dr., Huntington Beach, Calif. 92646

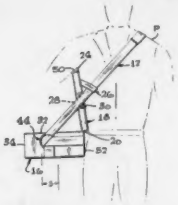
Filed Mar. 26, 1980, Ser. No. 134,183
Int. Cl.³ A45F *5/00*
U.S. Cl. 224—202 **9 Claims**

1. An instrument case apparatus that can be carried on the shoulder and opened while still on the shoulder, comprising:

a lower case part having opposite side walls, and having a front, rear, bottom, and open top;

a cover pivotally mounted to the rear of the lower case part, to open and close over the top of the lower case parts;

a shoulder strap having opposite ends mounted to said opposite side walls of said lower case part; and



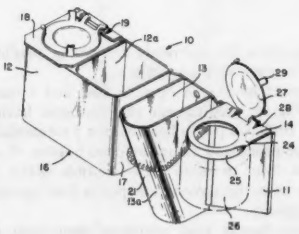
fastener means operable after the cover has been opened, for fastening together locations on said strap and cover to prevent movement of said strap relative to said cover in a direction which would close the cover, so that stiffness of the strap against compression along its length when the strap is under tension by carrying it on the shoulder, can be utilized to prevent the cover from closing.

4,323,181

BELT-MOUNTED FISHING TACKLE CARRIER

John Spasoff, P.O. Box 5757, Renton, Wash. 98031

Filed Jan. 19, 1981, Ser. No. 226,213
Int. Cl.³ A45F *5/00*
U.S. Cl. 224—253 **6 Claims**



1. A belt-mounted tackle carrier comprising:

a body fabricated of a suitable, semi-rigid sheet material and having belt loops on one side;

a fishing-rod support compartment issuing in an upstanding orientation from the body on the side opposite the belt loops, the compartment being a substantially rigid pocket open at its upper end;

a utility compartment having a hingedly mounted cover; and

a bait-jar mounting bracket having a threaded jar coupling and a hingedly mounted cover.

4,323,182

LUGGAGE CARRIER ASSEMBLY

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 845,846, Oct. 27, 1977, Pat. No. 4,162,755.
This application Jul. 27, 1979, Ser. No. 61,380
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.
Int. Cl.³ B60R *9/04*
U.S. Cl. 224—321 **9 Claims**

1. A luggage carrier assembly for an automotive vehicle or the like, comprising

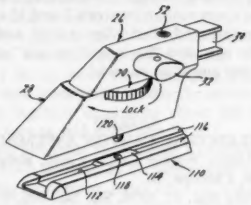
a pair of spaced parallel article constraining members and a

pair of stanchion elements associated with each of said members,

each of said stanchion elements having means defining a passage arranged at generally right angles to the surface of the vehicle upon which the assembly is mounted, at least one of said stanchion elements having means defining an opening arranged generally parallel to the surface of the vehicle upon which the assembly is mounted,

cooperable mounting means associated with said vehicle,

a fastening member disposed in part within each of said passages and having a lower end portion adapted for



detachable engagement with said cooperable mounting means on the vehicle, and

manually engageable wheel means cooperable with the upper end of each of said fastening members, whereby said fastening member may be manually biased between engaged and disengaged relationship with said mounting means on said vehicle for selectively securing said stanchion elements and said article constraining members to said vehicle, and for detaching the same from said vehicle,

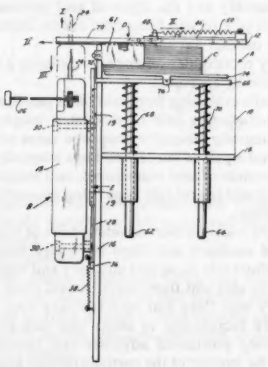
said at least one stanchion element having said opening having said wheel means disposed in said opening wherein said opening provides access to said wheel means.

4,323,183

TAG DISPENSER FOR HAND-HELD ATTACHER

Daniel Duchin, 1374 Blue Spruce La., Wantagh, Long Island City, N.Y. 11793

Filed Jan. 24, 1980, Ser. No. 114,955
Int. Cl.³ B31F *7/00*
U.S. Cl. 227—3 **35 Claims**



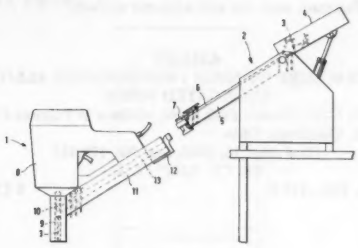
1. In combination, a hand-held manually actuated fastener attacher of the type having a hollow needle designed to penetrate a tag and an article to be tagged and through which a fastener is dispensed and a portable tag feeding device, the device comprising: a support; means for mounting a stack of tags on said support; tag transfer means; means for mounting said transfer means on said support for movement along a first position, aligned with said stack mounting means wherein a tag is engaged, and a second position, wherein a tag is aligned with the needle; means for mounting said support to the fastener attacher for relative manual movement therebetween, between an initial position, wherein said needle is spaced from said plane, and a second position, wherein said needle intercepts said plane; means for biasing said tag transfer means toward said first position; and means for latching said tag transfer means in said second position.

4,323,184

APPARATUS FOR FILLING THE MAGAZINE OF A FASTENER DRIVER

Werner Maurer, Nuertingen-Zizishausen, Fed. Rep. of Germany, assignor to Firma Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Apr. 15, 1980, Ser. No. 140,431
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916633
Int. Cl.³ B25C *5/06*
U.S. Cl. 227—120 **5 Claims**



1. An apparatus for supplying fasteners into a magazine means of a fastener driver, comprising magazine means for supplying fasteners to a fastener driver, slide pusher means slidable in said magazine means for pushing fasteners in said magazine toward said fastener driver, fastener supply chute means including gate means at the discharge end of said supply chute means, said slide pusher means being arranged for actuating said gate means when said magazine means is brought into a cooperating position relative to said fastener supply chute means when the slide pusher means is in a gate opening position.

4,323,185

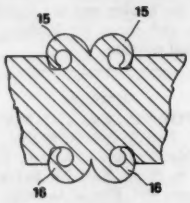
FRICTION WELDING PROCESS FOR MAKING HOLLOW BODIES SUCH AS ROLLERS AND SIMILAR ARTICLES

Walter Grilli; Emidio Manicardi, both of Modena, and Ivano Ferrari, Castelnuovo Rangone, all of Italy, assignors to Italtractor I.T.M. S.p.A., Castelvetro, Italy

Filed Feb. 5, 1980, Ser. No. 118,968
Claims priority, application Italy, Feb. 14, 1979, 40022 A/79
Int. Cl.³ B23K *20/12*
U.S. Cl. 228—114 **4 Claims**

1. A friction welding process, in particular for making hollow bodies such as rollers and similar articles, essential features of which process include the preparation of the edges of the two bodies to be head-on united, said process comprising: precisely shaping said edges along an axial cutting plane in which a front part of a preset gage and length visibly projects with respect to a rear part of a greater gage, the said front part being joined to the said rear part on at least one of the sides by means of a fillet comprising a concave surface section contacting, at a predetermined angle, the adjacent surface that laterally delimits the said rear part; carefully finishing the friction surface of the said front part of each edge with a finish whereby it becomes smooth, flat and free of any dent, chamfer

or radius at the corners, and has a low roughness coefficient; rotating said bodies, one with respect to the other, around a common axis, while pressing one against the other in the region of their respective front surfaces, whereby said bodies are



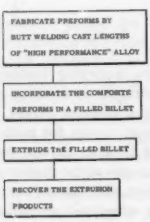
friction welded together and a burr is formed on each body as a result of the friction welding operation, which burr is folded back over itself and is spread out until it has been arranged tangentially in contact with the said fillet, in proximity of its edge of contact with the said adjacent surface.

4,323,186

MANUFACTURE OF HIGH PERFORMANCE ALLOY IN ELONGATED FORM

James G. Hunt, Terrace Park, Ohio, assignor to Polymet Corporation, Cincinnati, Ohio

Filed Aug. 18, 1980, Ser. No. 178,946
Int. Cl.³ B23P *17/00*
U.S. Cl. 228—173 E **5 Claims**


FABRICATE PREFORMS BY BUTT WELDING CAST LENGTHS OF "HIGH PERFORMANCE" ALLOY
INCORPORATE THE COMPOSITE PREFORMS IN A FILLED BILLET
EXTRUDE THE FILLED BILLET
RECOVER THE EXTRUSION PRODUCTS

1. A method of manufacturing wire and other components having a high length to cross section ratio, comprising the steps of

fabricating "high performance" alloy, extrusion preforms of a length greater than can be obtained by casting the "high performance" alloy,

said fabricating step including the steps of (a) selecting at least two lengths of "high performance" alloy in an "as cast" condition, the combined lengths of which are greater than the desired length of the preform, (b) squaring the ends of such lengths of "high performance" alloy which would abut when they are aligned to form a preform of the desired length, (c) welding such abutting ends to form joints between said lengths having a microstructure no coarser than the microstructure of the "as cast" lengths,

positioning a plurality of these composite preforms into a can in parallel relation with each other and parallel to the axis of the can,

closing off one end of said can with a cap,

introducing powdered filler material into said can to fill the spaces between said composite preforms and between the preforms and the interior surface of said can, said filler material being generally spherical with a diameter of less than 0.010 inch, said filler material being further characterized by an extrusion constant within approximately 40% of the extrusion constant of said rods,

compacting said filler material to a relative density of at least 0.33,

attaching a cap to the other end of said can to thus complete a filled billet in which the preforms are incorporated,

heating said filled billet to a temperature approximating the forging temperature of said preforms for a period of time sufficient for all portions of the billet to reach such temperature,

placing said preheated, filled billet in an extrusion press and extruding said billet at a pressure between approximately 30 and 120 tons/inch^2 at a rate between about 50 and 250 inches per minute through a die affecting an area reduction in the cross section between 3 and 45 times,

allowing the extruded filled billet to cool, and

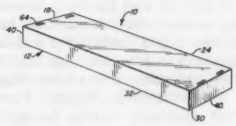
removing the extruded "high performance" alloy preforms from the can and filler material.

4,323,187

TELESCOPIC CARTON ASSEMBLY

Raymond A. Gillie, Walnut Creek, Calif., assignor to Arvey Corporation, Chicago, Ill.

Filed Apr. 17, 1978, Ser. No. 896,797
Int. Cl.³ B65D *5/22, 5/30, 5/68*
U.S. Cl. 229—34 R **10 Claims**



1. A telescopic carton assembly for use in connection with pre-sorted mail and the like, comprising:

a first carton;

a second carton for telescopically receiving and engaging said first carton;

one of said cartons providing the top part of said telescopic carton assembly and the other of said cartons providing the bottom part of said telescopic carton assembly;

each of said cartons having

a generally rectangular outer panel defining a plurality of tab-receiving apertures,

upright walls extending from said outer panel, said upright walls including a pair of elongated longitudinal side flaps integrally hinged to opposite sides of said outer panel, and a pair of lateral end flaps integrally hinged to opposite ends of said outer panel, said longitudinal side flaps and said lateral side flaps being generally rectangular in shape,

said upright walls further including pairs of longitudinally opposed auxiliary side flaps integrally hinged to said longitudinal side flaps, and auxiliary end flaps integrally hinged to said end flaps opposite said outer panel, said auxiliary side flaps and said auxiliary end flaps being generally rectangular in shape and said auxiliary end flaps being positioned adjacent said lateral end flaps within the interior of the carton to define lateral interior pockets for snugly receiving said auxiliary side flaps,

each of said auxiliary end flaps having a pair of laterally opposed tabs for interlockingly engaging said tab-receiving apertures to permit said carton to be erected without the use of glue, staples, gum tape or other auxiliary fasteners,

a first longitudinal pivotable flap integrally hinged to one of said longitudinal side flaps along an edge of said longitudinal side flap generally opposite said outer

panel, said first pivotable flap being generally rectangular in shape and generally of the same size and shape as said longitudinal side flap and said first longitudinal pivotable flap being movable to a side flap engaging position bearing against said longitudinal side flap within the interior of said carton,

a generally rectangular movable panel integrally hinged to said first pivotable flap along an edge of said first pivotable flap generally opposite said longitudinal side flap, said movable panel and said first pivotable flap together being about the same size as said outer panel,

a second longitudinal pivotable flap integrally hinged to said movable panel along an edge of said movable panel generally opposite said first pivotable flap, said second pivotable flap and said movable flap being movable together to an outer panel-engaging position bearing against said outer panel within the interior of said carton and together occupying about the same interior surface area as said outer panel,

said second pivotable flap having a concave finger-gripping portion defining an arcuate access opening generally midway along an outer edge of said second pivotable flap for facilitating gripping of said second pivotable flap, and said second pivotable flap having rounded corners for resisting interference with said upright walls during movement of said second pivotable flap, and

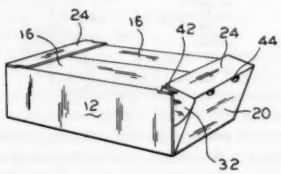
each of said cartons being adapted to provide a separate self-contained shipping container when telescopically separated from the other carton with said first pivotable flap and said movable panel providing the top of said self-contained shipping container and said second pivotable flap providing a closure flap for said self-contained shipping container.

4,323,188

COLLAPSIBLE CONTAINER

Robert B. Dickerson, Salem, N.C., assignor to Container Corporation of America, Chicago, Ill.

Filed Oct. 16, 1980, Ser. No. 197,499
Int. Cl.[3] B65D *5/36, 5/72, 5/18*
U.S. Cl. 229—41 R **4 Claims**



1. A collapsible container constructed from a one-piece blank of foldable material which is cut and scored, said container comprising:

(a) a bottom panel;

(b) side wall panels connected along fold lines to opposed front and rear side edges of said bottom panel and being folded up at right angles to said bottom panel, said side wall panels having cut-outs disposed along portions of their outer edges;

(c) top cover flaps connected along fold lines to upper edges of said side wall panels and being folded down in parallel relationship to said bottom panel; and

(d) end wall panels connected along fold lines to opposed end edges of said bottom panel and folded upwardly therefrom;

(e) a pair of end wall extension flaps hingedly attached to opposed side edges of said end wall panels and being folded inwardly at right angles to said end wall panels and disposed adjacent respective side wall panels;

(f) end cover flaps connected along fold lines to upper edges of said end wall panels;

(g) a pair of locking closure tabs connected to opposed side edges of said end cover flaps and being disposed between said side wall panels and said extension flaps, said closure tabs having cut-outs along portions of their inner edges;

(h) said closure tab cut-outs being positioned into a releasable interlocking relationship with said side wall panel cut-outs to maintain the container in a closed position; and

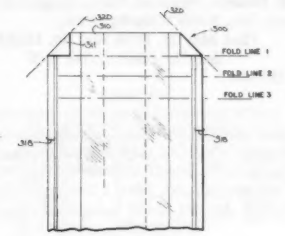
(i) said extension flaps being pivotable outwardly with said end panels relative to the fold lines connecting said end wall panels to said bottom panel when the container is opened for dispensing.

4,323,189

CLOSABLE POUCH

Joseph Regenstein, Jr., Chicago, Ill., assignor to Arvey Corporation, Chicago, Ill.

Filed May 27, 1980, Ser. No. 153,715
Int. Cl.[3] B65D *33/16, 33/18, 33/20*
U.S. Cl. 229—62 **8 Claims**



1. A two-ended, gusseted pouch sealed inwardly of a first end and having an opening that is foldingly self-sealed at a second end, said pouch comprising:

first and second opposing webs;

said webs having substantially coterminous opposed side edges defining side edges of the pouch, said second web having a transverse dimension greater than the first web, said second web further having first and second spaced parallel gusset fold lines adjacent each side edge to produce an inwardly extending first portion and an outwardly extending second portion in overlapping relation whereby a gusset is formed in said second web adjacent each side edge thereof;

means for adhering said first web to said second web to form a seal across said pouch inwardly of said first end and adjacent the side edges of said pouch;

said first web having a configuration before being foldingly self-sealed at said second end wherein at least one generally straight end edge of said first web defines a portion of the self-sealed pouch opening at said second end;

said second web having a configuration before being foldingly self-sealed at said second end wherein at least one generally straight end edge of said second web is orientated generally parallel to and in registry with said first web one generally straight end edge to define a portion of said self-sealed opening at said second end;

an adhesive sealing strip having a strip-like configuration carried on said first web parallel with and spaced inwardly from said first web one generally straight end edge, said adhesive sealing strip having two generally parallel, straight margins, said adhesive sealing strip extending transversely across said first web, said adhesive sealing strip defining a closure first fold line along the margin of the strip that is parallel to and nearest said first web one generally straight end edge, said strip defining a closure second fold line along the margin of the strip that is paral-

lel to and furthest from said first web one generally straight end edge;

two pharmacy folds of said webs at said second end of said pouch, one of said pharmacy folds being located at one side of said pouch and the other of said pharmacy folds being located at the other side of said pouch, each said pharmacy fold including a corner portion of said pouch folded inwardly along a substantially 45 degree fold line relative to said pouch side edges, said 45 degree fold line intersecting one of said pouch side edges at said first fold line; and

said pouch being foldingly self-sealed at said second end with said webs being folded away from said first web along said closure first fold line, then being folded along said closure second fold line, and then being folded along a closure third fold line that is in registry with the repositioned closure first fold line thus orienting the adhesive sealing strip against an adjacent region of the second web to form a self-sealed closure at said pouch second end.

4,323,190

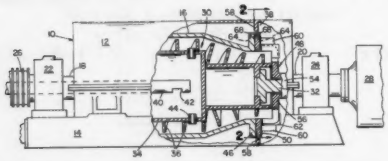
CENTRIFUGE BOWL END ATTACHMENT FLANGES

Norman F. Bessette, Somerset, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed May 21, 1980, Ser. No. 152,043

Int. Cl.³ B04B *11/00, 7/08*

U.S. Cl. 233—46 **11 Claims**



1. The combination of a rotary centrifuge bowl having an end with a radially projecting flange and a bowl end member having a radially projecting flange for attachment to said bowl flange, at least one of said flanges comprising:

a series of regularly spaced cavities extending transversely therethrough near the periphery thereof, each said cavity opening through the flange periphery to provide a slot of lesser width than the cavity extending transversely across said flange periphery, the peripheral spacing of the center lines of said slots being less than 15 inches; and

a series of plugs secured in said cavities with a portion thereof protruding through the said cavity slot to project above the flange periphery, said portion being of lesser width than the remainder of said plug and having abrasive wear resistance at least approximately equal to that of 90% aluminum oxide ceramic.

4,323,191

HUMIDIFYING APPARATUS FOR AN AIR-CONDITIONING EQUIPMENT

Tsuneyuki Chiyoda, and Masami Ohtani, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1980, Ser. No. 129,677

Claims priority, application Japan, Mar. 13, 1979, 54-31187[U]

Int. Cl.³ B01F *3/02;* B05B *1/08*

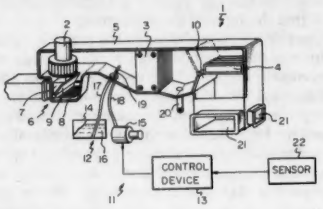
U.S. Cl. 236—44 A **5 Claims**

1. An apparatus for humidifying the air of a vehicle, comprising

means including a humidity sensor adapted to be disposed at a given position within the vehicle for producing a detecting signal indicating the humidity at said position has attained a predetermined value;

a humidfying device for humidifying air within said vehicle;

a pulse generator for producing a repetitive pulse signal having a predetermined period at predetermined intervals; and



control means receiving said detecting signal and said pulse signal for operating said humidifying device periodically in accordance with said predetermined period of said pulse signal when the humidity at said location is below said predetermined value.

4,323,192

CONTROL ARRANGEMENTS FOR HEATING CIRCUITS

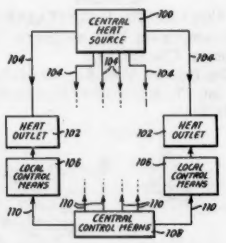
Harold E. Jackson, Winchester, England, assignor to Plympton Patents Limited, Hampshire, England

Filed Jan. 22, 1980, Ser. No. 114,343

Claims priority, application United Kingdom, Jan. 23, 1979, 02393/79

Int. Cl.³ F23N *5/20;* F24D *3/00*

U.S. Cl. 236—46 R **10 Claims**



1. In a control arrangement for a heating system having a plurality of heat outlets, the control arrangement comprising a central control means disposed remote from the heat outlets and including a time switch operative to cause the heat outlets to provide different heat outputs during different parts of a predetermined period of time, and respective thermostat means for each heat outlet to control the heat output thereof, the improvement comprising:

each thermostat means being capable of actuating the associated heat outlet at different temperatures;

said time switch being operative to cause said thermostat means to actuate the heat outlets at different temperatures at different times to provide the different heat outputs during different parts of the predetermined period of time; and

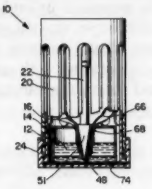
said central control means including, for each heat outlet, a manual switch coupling said time switch to the associated heat outlet via the associated thermostat means to manually set the heat output of the associated heat outlet, said time switch and each manual switch cooperating in such a manner that at least one may override the other so that the area heated by each heat outlet may be maintained at an appropriate temperature.

4,323,193

WICK-TYPE SLOW DIFFUSION DISPENSER

Donald B. Compton, Montgomery; William P. Lewis, West Chester, and Toan Trinh, Maineville, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 92,169, Nov. 7, 1979. This application Nov. 9, 1979, Ser. No. 92,905
Int. Cl.[3] A24F *25/00*
U.S. Cl. 239—44 6 Claims



1. A liquid perfume dispenser comprising a supply of a volatizable multi-component liquid perfume to be dispensed at a desired diffusion rate, a reservoir which maintains said perfume supply in isolation from ambient air, and a sheet form wick having a foot portion which contacts said isolated liquid perfume supply and wherein said wick has a remote portion providing an evaporative surface in contact with the ambient air, wherein:

A. said remote portion has a retention weight no more than 10 milligrams of said perfume per square centimeter of said evaporative surface; and wherein said remote portion has an absorptive capacity of from about 1.75 to about 4.25 times its weight of said perfume and wherein the basis weight of said remote portion is from 15 to 50 grams per square meter; and wherein said remote portion has a vertical wicking height of at least 5 centimeters; and

B. wherein said liquid perfume supply comprises a multi-component liquid selected from the group consisting of high, low and moderate volatility materials, wherein 50% to 100% by weight of said perfume supply materials is of low and moderate volatility; wherein the total weight of said low volatility materials in said perfume supply is no more than 34% of the holding capacity of said remote portion of said wick, and

wherein said dispenser and said multi-component perfume to be dispensed maintains in said remote portion a relatively constant composition of said multi-component liquid, and wherein said multi-component liquid evaporates at a relatively steady rate over the life of the dispenser.

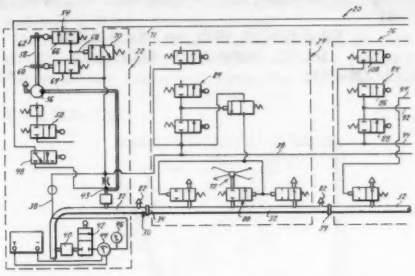
4,323,194

SPINNER WATER DRIVE SYSTEM AND CONTROL

Don Newbold, Fremont, and Owen W. Sherwin, Omaha, both of Nebr., assignors to Valmont Industries, Inc., Valley, Nebr.

Filed Dec. 18, 1979, Ser. No. 104,956
Int. Cl.[3] A01G *25/09*
U.S. Cl. 239—177 19 Claims

1. A center pivot irrigation system comprising a main conduit, a plurality of sprinklers spaced along the conduit for applying water to a field, a plurality of support towers spaced along said conduit, a spinner drive at each support tower for powering its associated support tower and the conduit, each spinner drive having at least one associated sprinkler, means to control each spinner drive and its associated sprinkler so that said associated sprinkler is sequenced on whenever the spinner drive is off, each spinner drive and its associated sprinkler having a sufficient water delivery so that the portion of field irrigated by each spinner drive and sprinkler combination



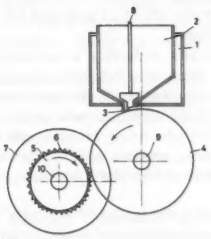
receives substantially the same application of water as other portions of the field being irrigated.

4,323,195

ROTARY-TYPE MELT APPLICATOR

Mutsuo Okajima, Narashino, and Hideo Hisada, Tokyo, both of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki, Japan

Continuation of Ser. No. 949,101, Oct. 6, 1978, abandoned. This application Jul. 2, 1980, Ser. No. 165,236
Claims priority, application Japan, Oct. 14, 1977, 52/123899
Int. Cl.[3] B05B *3/02*
U.S. Cl. 239—215 5 Claims



1. A rotary-type melt applicator for applying a molten marking composition to a road surface to form traffic or pavement markings on a road comprising:

(a) only one composition applicator roller rotatable in a direction to apply molten marking composition to said surface and having a multiplicity of sharp peripheral teeth extending radially therefrom;

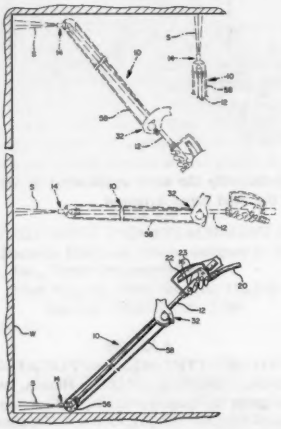
(b) only one smooth-surface feeder roller rotatable in a direction of rotation opposite from that of the applicator roller and disposed adjacent thereto for feeding molten marking composition to the applicator roller; and

(c) only one hopper containing the molten marking composition disposed above the feeder and applicator rollers, the hopper having a marking composition outlet for feeding marking composition to the feeder roller and a plug-shaped closure member fitted to said outlet, the outlet having top and bottom portions with the bottom portion having the same radius of curvature as the feeder roller and said closure member having a bottom portion having the same radius of curvature as the feeder roller.

4,323,196
PAINT SPRAYING APPARATUS

Gerald W. Logue, 3566 Aldous Ave. S., Salem, Oreg. 97302, and Rudolph R. Schnepel, 4596 Thrush Dr. NE., Salem, Oreg. 97301

Filed Feb. 22, 1980, Ser. No. 123,658
Int. Cl.[3] B05B *15/08;* B08B *3/02*
U.S. Cl. 239—532 4 Claims



1. In spraying apparatus for discharging fluid under pressure including an elongate tube having a nozzle pivotally mounted adjacent one end thereof and a handle mounted adjacent the other end operable for delivering fluid under pressure from a source through the elongate tube and the nozzle, the improvement comprising:

orienting means including a manually rotatable member mounted adjacent the handle operable for rotation about an axis extending generally transversely to the longitudinal axis of the elongate tube and coupled to the nozzle operable for selectively pivoting the nozzle, relative to the elongate tube, about a nozzle pivot axis extending generally transversely to the longitudinal axis of the elongate tube;

a block member detachably clamped to the elongate tube adjacent the handle for rotatably journalling said rotatable member;

first pulley means concentrically mounted on said rotatable member and second pulley means connected to the nozzle, said first and second pulley means being interconnected by a cable means trained on each pulley means, said second pulley means being detachably mounted on the nozzle; and

clamping members clamped on the nozzle for providing a mount for said second pulley means.

4,323,197
ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

Teru Morishita, Shizuoka; Matsuyoshi Sugiyama, Susono, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 11, 1980, Ser. No. 168,631
Claims priority, application Japan, Feb. 18, 1980, 55/17892
Int. Cl.[3] B05B *5/04;* F16C *27/00, 32/06*
U.S. Cl. 239—703 21 Claims

1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

a metallic rotary shaft rotatably arranged in said housing and having a front end and a rear end;

a cup shaped metallic spray head fixed onto the front end of said rotary shaft and having a cup shaped inner wall;

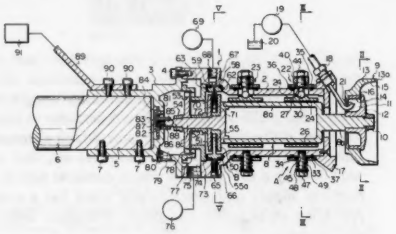
feeding means for feeding a paint onto said cup shaped inner wall;

drive means cooperating with said rotary shaft for rotating said rotary shaft;

a generator generating a negative high voltage and having an output connected to said housing;

electrode means arranged in said housing and electrically connecting said output to said spray head;

non-contact type thrust bearing means arranged in said housing and cooperating with said rotary shaft for axially supporting said rotary shaft under a non-contacting stage, and;

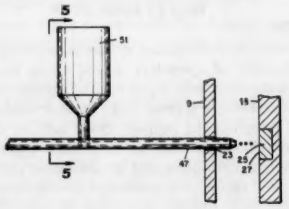


non-contact type radial air bearing means arranged in said housing and cooperating with said rotary shaft for radially supporting said rotary shaft under a non-contacting state, said radial air bearing means comprising a bearing support frame mounted on an outer wall of said housing via O rings, a plurality of pads, each having an inner face which extends along a circumferential outer wall of said rotary shaft and each being arranged to be spaced from the circumferential outer wall of said rotary shaft by a slight distance, a plurality of support pins, each being connected to said bearing support frame and pivotally supporting said corresponding pad, and a connecting member interconnecting said bearing support frame to said housing for preventing the relative rotation therebetween.

4,323,198
METHOD FOR FRACTURING SILICON-CARBIDE COATINGS ON NUCLEAR-FUEL PARTICLES

Lloyd J. Turner, Oak Ridge; Melvin G. Willey, Knoxville; Sue M. Tiegs, Lenoir City, and John E. Van Cleve, Jr., Kingston, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 70,365, Aug. 28, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 191,613
Int. Cl.[3] B02C *19/12*
U.S. Cl. 241—5 4 Claims



1. In the art of processing particles, the improved method comprising:

providing a chamber containing an impaction surface,

introducing to said chamber and impinging on said surface a stream of carrier gas containing serially entrained similar spheroidal particles, each having a carbon core which contains nuclear-fuel material and has a silicon-carbide coating, said stream having a volumetric flow rate which is at substantially a minimum value effecting fragmentation of said coating by impingement on said surface, to generate a gas stream containing particulates resulting from said impingement,

directing said gas stream containing particulates through a channel of gradually decreasing cross-sectional area to accelerate its rate of flow,

providing a vortex-flow type of separator having an inlet, and

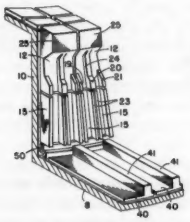
tangentially introducing to said inlet the gas stream issuing from said channel to remove entrained particulates therefrom.

4,323,199

MILL LINER FOR DRY AUTOGENOUS MILLS

Colin D. Jardine, Newfoundland, Canada; Sooi Chong, Cleveland, Ohio; Rodney H. Coles, and Stephen Hebb, both of Newfoundland, Canada, assignors to The Hanna Mining Company, Cleveland, Ohio

Filed Feb. 27, 1980, Ser. No. 182,417
Int. Cl.³ B02C *17/22*
U.S. Cl. 241—284 **25 Claims**



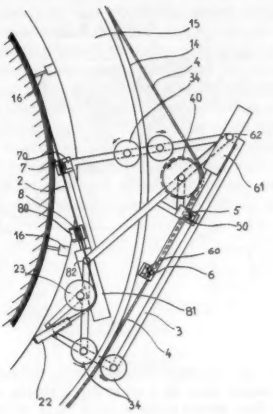
1. In a dry autogenous mill construction including a shell and opposite ends with central feed and discharge openings therein through which material is fed into the mill and subsequently discharged therefrom, said shell and ends being lined, the improvement comprising low profile end liner means covering such mill ends, said end liner means including radially extending rib means for obtaining a lifting action of the material within the mill during the grinding operation, and said end liner means also including head portions at the radial inner ends thereof adjacent said central discharge and feed openings which protrude axially beyond said radially extending rib means to protect said rib means against undue wear and restrict the axial spacing between the ends of said mill through which the material falls as the material is carried upwardly during rotation of the mill, said end liner means including a single row of low profile inner head liner members adjacent said central feed and discharge openings at opposite ends of said mill, and a single row of outer head liner members radially outwardly of said row of inner head liner members, said radial rib means extending the entire length of said outer head liner members, and extending from the radial outermost ends of said inner head liner members for a portion of the length of said inner head liner members providing a continuation of the rib means on said outer head liner members, each of said inner head liner members providing a common base for a plurality of said radial rib means, and each of said head portions being on said inner head liner members radially inwardly of a plurality of said rib means thereon.

4,323,200

APPARATUS AND METHOD FOR WINDING AN ELONGATE MEMBER ONTO A BODY UNDER TENSION

Gaston Denoor, and Georges Thillet, both of Grenoble, France, assignors to B.V.S., Grenoble, France

Continuation-in-part of Ser. No. 805,607, Jun. 10, 1977, abandoned. This application Apr. 25, 1979, Ser. No. 33,220
Claims priority, application France, Sep. 17, 1976, 76 28032
Int. Cl.³ B21F *17/00*
U.S. Cl. 242—7.21 **14 Claims**



1. A device for winding an elongate member under tension onto a body, said device comprising:

a frame;

guide means for guiding the elongate member to the body;

means mounting said guide means on said frame;

means for maintaining said frame at a constant distance from the body;

means for displacing said frame around the body to wind said elongate member onto the body; and

means for controlling the tension in the elongate member as it is wound on the body;

said frame displacing means including:

a belt surrounding said body and fixed against rotation relative thereto;

first and second means for selectively engaging or releasing said belt, each of said first and second means being selectively movable relative to said belt when released from said belt,

means mounting said first belt engaging means on said frame in fixed relation thereto; and

means mounting said second belt engaging means on said frame for moving said second belt engaging means relative to said frame in the direction of winding of said elongate member when said first belt engaging means engages said belt and in the opposite direction when said second belt engaging means engages said belt.

4,323,201

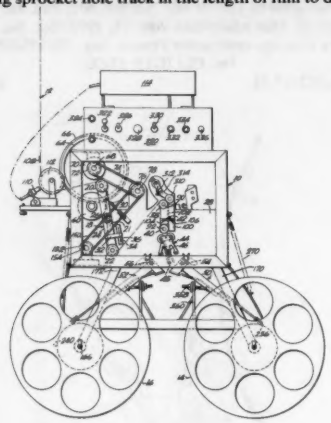
AUTOMATIC FILM DE-SPLICER AND WINDER

Joe Gonzalez, Rte. 12, Box 1163, Tallahassee, Fla. 32304

Filed Jul. 14, 1980, Ser. No. 167,838
Int. Cl.³ B65H *19/20*
U.S. Cl. 242—56 R **18 Claims**

1. Apparatus for severing separate lengths from a main continuous length of film which is marked with adhesive metallic tape at the spliced points and sequentially winding the separate lengths on spearate reels, including, a main frame, a main drive means, a pair of reels removably suspended beneath the frame in a spaced coplanar relation, film guide track means

for each reel, pivotally attached at an upper end to the frame and including an angularly extended lower end, normally in contact with a hub of the reel between side plates thereof; means to guide the main film length into the apparatus, means to tension the main film length, sprocket means engaged with an existing sprocket hole track in the length of film to drive the



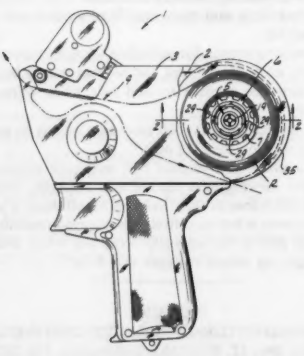
length of film through the apparatus, means to drive said sprocket means from said main drive means, cutter means to sever the film, means to sense each piece of metallic tape and to operate said cutter means in direct response thereto to sever the film, and means to selectively guide the film onto a hub portion of one of the pair of reels and to redirect the next separate length onto the other of said pair of reels.

4,323,202

ADAPTOR CORE

Gerald C. Laverty, Santa Clara, Calif., assignor to Cosco Industries, Inc., Spring Valley, N.Y.

Filed May 1, 1979, Ser. No. 34,966
Int. Cl.[3] B65H *75/02*
U.S. Cl. 242—68.5 **4 Claims**



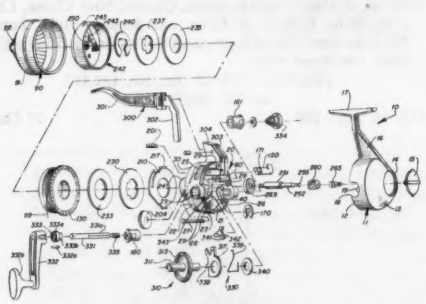
1. An adaptor core for rotatably mounting a coreless roll of labels or the like of the spindle of labeling apparatus, such as a labeling gun, of the type adapted for receiving only cored rolls of labels, said adaptor core comprising a hollow generally cylindrical body of one-piece construction having a generally cylindrical main body portion relatively large in diameter, a generally cylindrical hub portion of smaller diameter at one end of the main body portion, an annular shoulder portion joining the main body and hub portions, said hub portion having a central circular opening therein for receiving said spindle, and a series of relatively thin resilient fingers formed integrally with the body and extending radially outwardly therefrom at the periphery of the body, said core being adapted to be placed in the central opening of a coreless roll of labels with said fingers engaging the roll and being adapted to be sprung inwardly by the roll, the outward springing force exerted by the fingers against the roll being sufficient to secure the body in place relative to the roll with the opening in the body generally concentric with the opening in the roll for receiving said spindle thereby to rotatably mount the adaptor core and roll on the spindle.

4,323,203

SELECTIVE ANTI-REVERSE MECHANISM

Henry L. Neufeld, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 22, 1980, Ser. No. 218,923
Int. Cl.[3] A01K *89/01, 89/02*
U.S. Cl. 242—84.2 A **5 Claims**



1. In a spinning reel having a body portion of a deck plate with a first portion having a cylindrical wall projecting transverse to the deck plate and a second portion having a cylindrical wall projecting from the deck plate opposing the first portion, spaced apart aligned bearing means mounted in the cylindrical wall of the second portion and extending from the interior of the wall to the exterior of the wall, and a crank assembly rotatably mounted in the bearing means and extending therebetween having a crankshaft operable by a crank handle, and a gear mounted upon the shaft whereby rotation of the crank handle turns the gear to retrieve or to pay out fishing line, a selective anti-reverse device comprising:

a ratchet mounted upon the shaft for rotation therewith;

pawl means mounted upon the deck plate to pivotally engage the ratchet and prevent the pay out of fishing line and disengage the ratchet to permit both retrieval and pay out of the fishing line;

an anti-reverse drag means pivotally mounted upon the shaft having a lug in contact with the pawl means to pivot the pawl means in response to the pivoting of the anti-reverse drag means, and having a pair of diverging first and second arms;

an actuator means extending through the first portion between the first and second arms, the actuator means having a cam contacting the second arm to pivot the anti-reverse drag means in response to operation of the actuator means which, in turn, pivots the pawl means for engagement and disengagement of the ratchet; and

bias means interconnected between the shaft and the first arm to bias the pivoting of the anti-reverse drag means in the direction of shaft rotation thereby maintaining the engagement between the cam and the second arm.

4,323,204

BELT CLAMPS FOR VEHICLE PASSENGER RESTRAINT BELTS

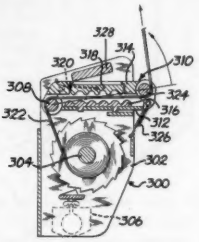
Juichiro Takada, 3-12-1, Shinmachi Setagayaku, Tokyo, Japan

Continuation-in-part of Ser. No. 21,634, Mar. 19, 1979, abandoned. This application Dec. 26, 1979, Ser. No. 107,161

Claims priority, application Japan, May 15, 1978, 53-63959; Jun. 8, 1978, 53-077235

Int. Cl.[3] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.2 **7 Claims**



1. A belt clamp for a vehicle occupant restraint system which includes a restraint belt and a belt retractor onto and from which the belt is selectively wound and unwound and having a pair of jaws, one on either side of the belt, mounted on a lever which is mounted to pivot about an axis spaced apart from the jaws, one of the jaws being mounted on the lever for movement toward the other jaw, in that there is a spring urging the movable jaw in a direction away from the other jaw and in that there is a fixed abutment positioned to be engaged by the movable jaw upon pivoting of the lever in response to a high pull-out force on the belt, thereby to move the movable jaw into engagement with the other jaw, at least one of the jaws having a multiplicity of closely spaced teeth lying transversely to the direction of movement of the belt, each tooth being of generally uniform cross section along its length in the transverse direction, and the other jaw having a multiplicity of recesses, each of which generally matches a corresponding tooth on the other jaw and receives such corresponding tooth and a widthwise strip of the belt upon engagement of the belt between the jaws, each such strip of the belt being formed into a smoothly curved loop by being tucked by a tooth into a corresponding recess of the other jaw and being gripped under pressure between opposed gripping surfaces of the teeth and recesses.

4,323,205

SAFETY SEAT-BELT RETRACTOR

Noboru Tsuge, Kariya; Satosi Kuwakado, and Toshiaki Shimogawa, both of Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 26, 1980, Ser. No. 163,265

Claims priority, application Japan, Jul. 19, 1979, 54-100419[U]

Int. Cl.[3] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **5 Claims**

1. In a retractor for safety seat-belt to be fitted on a passenger, for use in vehicles, comprising:

a fixed frame;

a winding shaft rotatably mounted on said frame, said seat-belt having one end thereof secured to said shaft and partly wound therearound;

a toothed member mounted on said winding shaft for relative rotation thereto;

locking means operative in response to a predetermined deceleration of a vehicle to engage with said toothed member for locking the same against rotation relative to said fixed frame; and

an elongated energy-absorption member having one end thereof secured to said winding shaft,

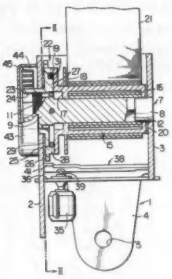
the improvement which comprises:

a projection on an axial end face of said toothed member and radially outwardly spaced from said winding shaft to define a first gap between said projection and said shaft;

said elongated energy-absorption member having the other end free and extending through said first gap and around said projection in U-shape engaging therewith;

confining means spaced radially outwardly from said projection to define a second gap between said confining means and said projection, said confining means cooperating with said projection to confine said elongated energy-absorption member in said second gap so as to cause said elongated energy-absorption member to extend around said projection in U-shape having a constant radius;

said elongated energy-absorption member having imparted thereto a resistance against being drawn when said winding shaft is rotated relative to said toothed member to draw said elongated energy-absorption member through said first and second gaps while maintaining said elongated energy-absorption member in U-shape having a



constant radius around said projection by said confining means; and

said elongated energy-absorption member being drawn through said first and second gaps by said winding shaft and wound therearound to absorb a tension on said seat-belt when said toothed member is locked against rotation relative to said fixed frame by said locking means and the tension on said seat-belt exceeds said resistance imparted to said elongated energy-absorption member,

wherein said elongated energy-absorption member has a circular cross-section and has a free end portion extending around said shaft between the same and said confining means, and

wherein said winding shaft is axially movably mounted on said fixed frame and has a threaded portion, and said toothed member has a threaded portion threadedly engaging with said threaded portion on said winding shaft, said winding shaft being axially movable relative to said toothed member upon the rotation of said winding shaft relative to said toothed member when said toothed member is locked against rotation by said locking means and the tension on said seat-belt exceeds said resistance imparted to said elongated energy-absorption member.

4,323,206

REEL HOLDER HAVING BRAKE ACTION

Larry W. Dickey, Hackettstown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 29, 1980, Ser. No. 192,075

Int. Cl.[3] **B65H** *49/00, 59/16*

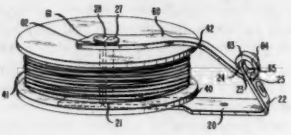
U.S. Cl. 242—129.6 **6 Claims**

1. Apparatus (**10**) for mounting a reel (**40**) having a material (**41**) wound thereon comprising:

a rigid support member (**20**);

a first projection (**21**), extending generally perpendicularly from said support member, for holding said reel; characterized in that said apparatus further includes;

a second projection (**22**) spaced apart from said first projection and extending outwardly from said support member; and



means (**60,61,62,63,64,65**), fastened to said second projection and frictionally engaging an edge (**42**) of said reel to said first projection, for providing a braking action to said reel as said material is drawn therefrom.

4,323,207

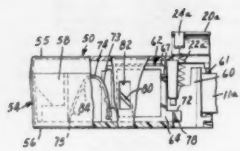
LATCH ASSEMBLY FOR A VIDEO TAPE CASSETTE

Charles D. Gebeke, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 11, 1977, Ser. No. 795,867

Int. Cl.[3] **G03B** *1/04;* **G11B** *15/32*

U.S. Cl. 242—198 **1 Claim**



1. In a video tape cassette comprising a length of magnetizable recording tape, two reels each supporting a different helically wound end portion of said tape, a generally rectangular housing enclosing and supporting said reels for rotation to transfer tape between said reels, said housing including an outer front wall having a generally planar end portion, a recessed portion and means for guiding tape between said reels through said outer wall and across said recessed portion to provide a tape access area, a door, a hinge pivotably mounting said door on said housing for movement between a closed position over said tape access area and an open position spaced from said tape access area, means for biasing said door to said closed position, and latch means for releasably retaining said door in said closed position comprising a channel on the edge of said door opposite said hinge adjacent said planar end portion, a movable member slidably mounted in said housing for straight line movement along said planar end portion between engaged and disengaged positions, said movable member including a projection adapted to enter said channel when said door is in said closed position to retain said door in said closed position and a cam surface adapted for engagement through said planar end portion to move said movable member to said disengaged position, and means for biasing said movable member to said engaged position, the improvement wherein said movable member and said means for biasing said movable member to said engaged position are an integral unit of flexible resilient polymeric material with said movable member being a relatively rigid movable portion of said unit, and said means for biasing being an elongate portion of said unit having one end joining said movable portion, an opposite end adapted to engage said housing, and an arcuate generally U-shaped part which is resiliently bent to bias said movable portion toward said engaged position.

4,323,208

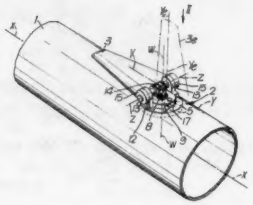
FOLDING FINS

James Ball, Bristol, England, assignor to British Aerospace, Weybridge, United Kingdom

Filed Feb. 1, 1980, Ser. No. 117,640

Int. Cl.[3] **F42B** *13/32, 15/16*

U.S. Cl. 244—3.28 **4 Claims**



1. A flight vehicle having a generally elongate body with a fore and aft axis and at least one folding fin assembly, said assembly including a base member attached to said body, a fin having a generally chordwise axis which extends from the leading edge towards the trailing edge of the fin when in use and a generally spanwise axis which extends generally perpendicular to said chordwise axis and from said tip towards said base of said fin, a turntable member for turning relative to said base member, spigot means extending from said base member through said turntable member, turntable bearing means carried by said spigot member by which said turntable is rotatably located, fin bearing means on said turntable member by which said fin is pivotably carried on said turntable member for pivotable movement about its chordwise axis, transmission means having a first part fixedly associated with said spigot means and a second part fixedly associated with said fin and coupled with said first part whereby pivotal movement of said fin about its chordwise axis from a position in which its spanwise axis lies generally parallel to said fore-and-aft axis and with said fin lying generally flat alongside said body of said flight vehicle with its chordwise axis lying generally transverse thereto, to a position in which said spanwise axis of said fin lies generally perpendicular to the fore-and-aft axis causes the second part of said transmission means to rotate bodily around said first part whereby the turntable member is turned with respect to said base member and the chordwise axis of said fin lies generally parallel to said fore-and-aft axis.

4,323,209

COUNTER-ROTATING VORTICES GENERATOR FOR AN AIRCRAFT WING

Roger A. Thompson, 7606 Joplin, Apt. 2, Houston, Tex. 77087

Continuation-in-part of Ser. No. 816,732, Jul. 18, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,221

Int. Cl.[3] **B64C** *23/06*

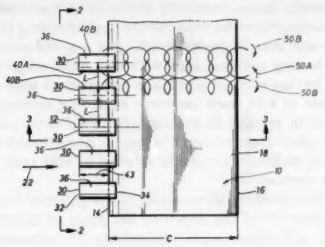
U.S. Cl. 244—199 **13 Claims**

1. Apparatus for increasing the lift generated by an aircraft wing, having upper and lower surfaces, while propelled through a fluid medium comprising:

a finger mounted adjacent to the leading edge of the wing and extending forwardly therefrom, said finger having a first dimension measured with respect to the forward direction and a second dimension measured in a direction transverse thereto, said finger having lateral edges thereon;

said finger being mounted on the wing such that as the wing is propelled through the fluid medium impingement of the fluid medium on said finger produces, by flow around said

lateral edges, a first and a second vortex trailing rearwardly from said finger over the wing in the direction of the fluid flow, each of said vortices being in contact with and counter-rotating with respect to the other;



said finger being sized such that each vortex produced thereby is of sufficient size and strength to modify the flow pattern above the boundary layer on the wing upper surface so as to effect an increase in the lift; and

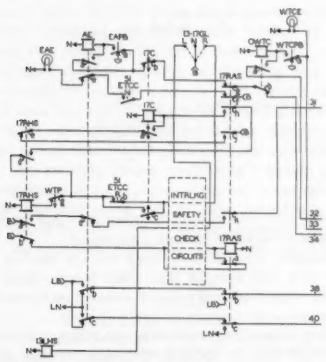
mounting struts for supporting said finger above the surface of the wing at the leading edge thereof.

4,323,210

MANUAL BLOCK TRAFFIC CONTROL AND SIGNALING SYSTEM FOR RAILROADS

J. Calvin Elder, Penn Hills, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Sep. 4, 1980, Ser. No. 183,906
Int. Cl.³ B61L *21/04*
U.S. Cl. 246—26 **6 Claims**



1. A traffic control and signal system for a single track railroad over which trains move in either direction between first and second stations, under authority of wayside departure signals at each station, comprising,

(a) a communication channel coupling said first and second stations,

(b) request means at each station coupled to said communication channel and manually operable for transmitting to the other station a first signal requesting a train movement from the associated station to the other station,

(c) a register means at each station coupled to said channel for receiving said first signal and manually operable, in response to the reception of said first signal, for transmitting to the other station a second signal acknowledging and accepting said train movement request.

(d) a wayside signal control means at each station enabled by the transmission of said first signal and responsive to the subsequent reception of said second signal for actuating the associated departure signal to authorize said requested train movement to the other station,

(e) said communication channel further controlled in response to a train departure from the associated station for inhibiting the transmission of any first or second signal from either station while said train traverses the single track stretch,

(f) a detection means at each station coupled to the track and responsive only to the arrival of an inbound train from the other station for registering that train's arrival,

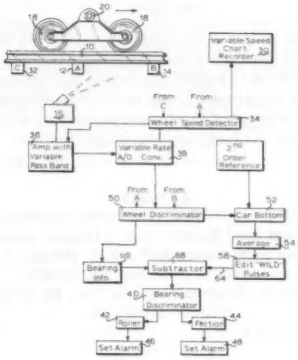
(g) each detector means coupled to said communication channel and manually operable for transmitting a third signal to the other station, when a train arrival is registered, to confirm the completed train movement and to actuate a reset of both stations and said communication channel to enable preparation of the system for a subsequent train movement in either direction.

4,323,211

SELF ADJUSTING WHEEL BEARING HEAT SIGNAL PROCESSING CIRCUIT

Joseph E. Bambara, North Babylon, and W. Woodward Sanville, Brentwood, both of N.Y., assignors to Servo Corporation of America, Hicksville, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,770
Int. Cl.³ G08B *21/00*; B61L *3/00*
U.S. Cl. 246—169 A **12 Claims**



1. A railroad car hot box detector system comprising:

infra-red responsive scanner means positioned along a section of track and adapted to scan passing railroad cars within a sensing zone along said track and to generate a signal in response thereto, said signal including portions thereof having an amplitude and waveform indicative of the passing of a wheel bearing and the temperature and type thereof;

variable circuit means for digitally processing samples of said signal to determine the condition of said bearing; and,

conditioning circuit means for detecting physical conditions of said car including car speed and for varying said processing circuit in response to said car conditions.

4,323,212

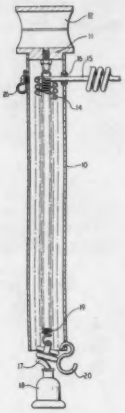
MOUNTING DEVICES

John G. Macaulay, Beaconsfield, England, assignor to Toppy's Salons Limited, London, England

Filed Mar. 31, 1980, Ser. No. 135,221
Int. Cl.³ F16L *3/00*
U.S. Cl. 248—51 **21 Claims**

1. A device for mounting a hair drier or other electrical device, the mounting device comprising an elongate tube, suspension means to suspend the tube from a support, with the tube extending in a downward direction, an extendable electric

lead for the electrical device, the lead being urged into the tube by biasing means, but being capable of being withdrawn from the tube against the action of the bias when the lead is extended, and means for releasably attaching the electrical device to the tube, the mounting device being such that when the tube is suspended from a support and an electrical device is



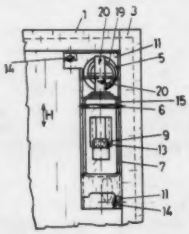
connected to the lead, the electrical device can be released from the tube and moved away from the tube when it is to be used, the extendable lead being drawn out of the tube against the action of the bias, and when use of the electrical device is over, it can be returned to a storage position by attaching it to the tube again, the lead returning within the tube.

4,323,213

SUSPENSION FITTING FOR CABINETS

Erich Röck, and Josef Brunner, both of Höchst, Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Nov. 6, 1980, Ser. No. 206,854
Claims priority, application Austria, Nov. 19, 1979, 7340/79
Int. Cl.³ E04G 5/06
U.S. Cl. 248—222.1 **5 Claims**



1. A suspension fitting for mounting a piece of furniture on a wall, said fitting comprising:

a supporting member adapted to be fastened to a body of a piece of furniture, said supporting member including a plate adapted to extend generally parallel to the plane of a wall of the body of the piece of furniture, said plate having wherein a hole;

a hook member mounted on said supporting member for relative vertical movement therebetween, said hook member having at a lower portion thereof means for mounting said hook member, and thereby said supporting member and the piece of furniture, in a mounted position in a suspension rail to be fastened to a wall;

means for adjusting the relative vertical position of said supporting member with respect to said hook member, said vertical adjusting means comprising a disc having a pin rotatably positioned in said hole in said plate of said supporting member, said disc having extending therefrom, on a side thereof opposite said pin, a spiral projection, a rack having teeth meshing with said spiral projection, said rack having a lower portion in engagement with an upper portion of said hook member, such that rotation of said disc with respect to the center of said hole causes said spiral projection to move said disc, and thereby said supporting member, vertically relative to said rack and said hook member; and

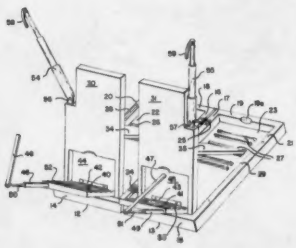
means for adjusting the position of the piece of furniture in the direction of the depth of the piece of furniture, said depth adjusting means comprising an adjusting screw extending through said plate of said supporting member and threaded into a threaded portion of said hook member, whereby rotation of said adjusting screw causes relative movement in said direction of depth between said hook member and said supporting member.

4,323,214

BOOK READING REST

Nicholas E. DeLuca, 125 Susan Dr., Pittsburgh, Pa. 15220

Filed Jul. 21, 1980, Ser. No. 170,524
Int. Cl.³ A47B 97/04
U.S. Cl. 248—452 **4 Claims**



1. A reading rest device for presenting the open pages of a book as a substantially flat surface comprising:

two rectangular box sections, each section having a flat bottom and four upright sides, said box sections being arranged with an edge of one in juxtaposition to an edge of the other;

hinge means connecting said adjacent edges whereby the box sections may be rotated relatively between an open position and a closed position in which the openings of the box sections are facing to form a closed box;

separate rest means pivotally connected to the box sections in substantially side-by-side relationship, one rest means being associated with each box section;

prop means extending between the rest means and box sections for adjustable sloping the rest means;

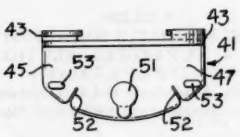
shelf means extending from each rest means adjacent the pivotal axis thereof and being foldable into a recess in the associated rest means;

rest means pivotally connected by an axially telescoping member to the shelf means associated with each rest member for rotation in a plane substantially parallel to the plane of the rest member whereby the pages of a book may be restrained from turning with adjustment for thickness of the pages; and

telescoping arm means associated with each rest member and extensible in the plane of the rest member whereby

the effective size of the rest member may be increased to accomodate books of larger size.

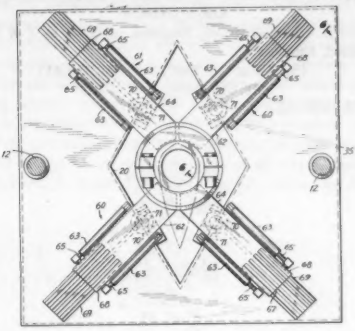
4,323,215
HANG-UP FIXTURE
Sol J. Berger, 3186 Doolittle Dr., Northbrook, Ill. 60062
Filed Mar. 10, 1980, Ser. No. 128,542
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—544 **6 Claims**



1. A fixture adapted for installation in position to be suspended from the base of an overhead horizontal beam such as inverted "T" shaped beam at the ceiling of a store, said fixture having a top portion with an upper surface adapted to bear against the base of such beam and when the fixture is twisted about a vertical axis while it is being held against the base of the beam the fixture is brought into an installed position where it is secured to the beam and from which position the fixture is releasable by initially and solely twisting it in the reverse direction about the same axis, said fixture including a pair of projections extending upwardly from said upper surface at the periphery thereof, each of said projections having a fin extending therefrom over said upper surface, the free end of each fin at the portion thereof facing the top of said upper surface of the fixture being tapered outwardly away from said top surface of the fixture, said projections being spaced apart to embrace opposite edges of the base at locations spaced longitudinally of the beam when the fixture has been twisted to its installed position, and when the fixture is thus twisted to its installed position with its upper surface engaging the base of the beam the underside of each fin engages over the top surface of the base of such beam to effectively lock the fixture to the base of such beam, said fixture having means whereby it may be twisted to and from its installed position with respect to such beam, said twisting means comprising a flange integral with and projecting at right angles from the lower side of said top portion and extending substantially completely across said lower side of the top portion, and said twisting flange including means for facilitating hanging of an object from it.

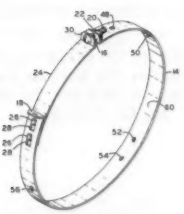
4,323,216
BALANCED SUPPORT PLATES
John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.
Filed Jan. 10, 1980, Ser. No. 111,165
Int. Cl.³ A47H *1/114*
U.S. Cl. 248—550 **13 Claims**

1. Support means for supporting relatively heavy weights from a horizontally extending, downwardly facing surface, the means comprising:
(a) a primary support platform;
(b) a plurality of load support members;
(c) connecting means for movably connecting the members to the primary support platform; and
(d) balancing means for substantially proportionately distributing the load among the plurality of support members, said balancing means comprising load-responsive connecting means operatively connected between at least one support member and the primary support platform, and sensing means for determining the instantaneous load applied to each support member, the load responsive connecting means causing the vertical movement of the support member, until the load is evenly distributed



among the support members, whereby net transverse stress is minimized on an object being supported.

4,323,217
MOTOR MOUNTING ASSEMBLY INCLUDING EXTENDABLE BAND
Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.
Continuation of Ser. No. 116,745, Jan. 30, 1980. This application Feb. 27, 1980, Ser. No. 125,037
Int. Cl.³ F16F *15/04*
U.S. Cl. 248—604 **11 Claims**



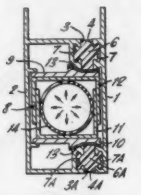
1. A mounting assembly for a motor comprising:
a flexible band capable of assuming a generally circular shape and having an inner circumferential surface,
a plurality of mounting arms interfitting with said band such that an end portion of each of the arms is disposed against the inner circumferential surface of the band and wherein the arms are circumferentially adjustable on said band,
locating means on each of said arms, and
locating means on said band capable of interfitting with the locating means on said arms for locating the arms on said band in various predetermined circumferential positions,
a first set of said locating means on said band having a first predetermined angular spacing when said band is disposed in a circular shaped having a first circumferential size and a second set of said locating means on the band having the same predetermined angular spacing when said band is disposed in a circular shape having a second circumferential size different than the first circumferential size, whereby said arms can be positioned at the same angular spacings for both circumferential sizes of said band.

4,323,218

INFLATABLE CORE FOR USE IN FORMING A THERMAL BREAK IN A METAL FRAME FOR A DOOR OR WINDOW

Douglas B. Plum, Nazeing, England, assignor to E & E Kaye Limited, England

Filed Aug. 22, 1980, Ser. No. 180,417
Int. Cl.[3] B29C 1/12, 27/00
U.S. Cl. 249—65 9 Claims



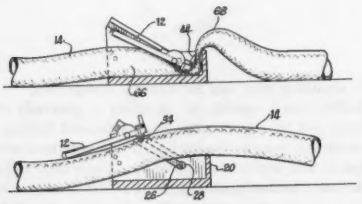
1. A jig for use in securing two elongate sections together by two spaced thermal barriers to form a hollow member, comprising a pair of elongate members to be located side-by-side within the sections between the locations where the thermal barriers are formed, each elongate member having mould base means extending along an outer side thereof to form with spaced opposing parts of the two elongate sections, mould cavities to receive thermal barrier material means to expand the pair of members of the jig laterally to engage the mould base means with the sections to form the required mould cavities and locating means on the members of the jig for engaging co-operating locating means on the sections on either side of the mould cavities to adjust the spacing of the sections in response to said lateral expansion of the jig to a requisite distance to create, after filling of the mould cavities with thermal barrier material, a hollow member of the required cross-sectional size.

4,323,219

AUTOMATIC HOSE CLAMP

Jack M. Carlin, RFD Box 135, Del Mar, Calif. 92014

Filed May 19, 1980, Ser. No. 151,317
Int. Cl.[3] F16L 55/14
U.S. Cl. 251—5 12 Claims



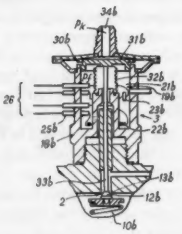
1. An automatic hose clamp for engaging a hose, comprising:
(a) a clamp assembly for said hose defining upstream and downstream hose portions adjacent thereto and being operable between a first position substantially restricting the flow of fluid through said hose and a second position substantially clear of said hose;
(b) release means adjacent to the downstream portion of said hose and responsive to the expansive pressure of same as it changes from a flaccid to a turgid state to move said clamp assembly into its second position substantially clear of said hose to permit free flow there through;
(c) said clamp assembly including a casing defining a hose corridor and a clamp bar movable to compress said hose against said casing in said first position; and
(d) said bar defining two end portions and a central gate, and including an actuator for displacing said gate relative to said end portions to permit the trickling of a fluid through the hose adjacent said gate.

4,323,220

ACTUATING APPARATUS FOR ADJUSTING A MOVABLE ELEMENT, PARTICULARLY THE CLOSURE MEMBER OF A VALVE

Zbigniew R. Huelle, Sonderborg, and Leif Nielsen, Nordberg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 956,573, Nov. 1, 1978, Pat. No. 4,258,899.
This application Dec. 8, 1980, Ser. No. 214,567
Int. Cl.[3] F16K 31/02; F03G 7/06
U.S. Cl. 251—11 1 Claim



1. A valve assembly, comprising a housing defining an inlet and an outlet and a valve opening therebetween, a closure element for said valve opening, said housing and said closure element forming an expansible operating chamber, bypass passage means in said housing having a first section extending from said inlet to said operating chamber and a second section extending from said operating chamber to said outlet, throttle means in said first section, pilot valve means including a valve element for modulatingly controlling fluid flow through said second section from said operating chamber to said outlet, said housing defining an expansible control chamber having an upper movable wall formed by a flat diaphragm, said control chamber having a cylindrically shaped upper internal surface, a piston plate attached to the underside of said diaphragm and slidingly and sealing engaging said upper internal surface of said control chamber, rod means extending between said piston plate and said valve element, sealing means between said rod means and the interior of said control chamber, a liquid/vapor type filling for said control chamber biasing said diaphragm in a direction to expand said control chamber and move said valve element in a closing direction, port means in said housing for admitting pressurized control fluid to the upper side of said diaphragm for contracting said control chamber and moving said valve element in an opening direction, electric heating means and temperature sensor means in said control chamber, electric contact means extending from outside said housing to the interior of said control chamber connected to said heating means and said temperature sensor means, and resilient biasing means in said operating chamber between said closure element and said valve element to provide a supplementary force relative to the pressure in said operating chamber, and control means connected to said electric control means for reading the temperature of said filling and for selectively turning on said heating means to cause said pilot valve means and said closure element to assume predetermined intermediate positions of stable equilibrium corresponding to a controlled range of pressures in said control chamber.

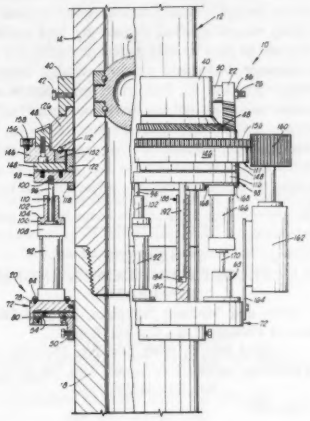
4,323,221
POWER ACTUATED VALVE

Hubert D. Krober, P.O. Box 338, Cheyenne, Okla. 73628, and Thomas Kelly, 1729 Westminster Pl., Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 26,340, Apr. 2, 1979. This application Apr. 24, 1980, Ser. No. 143,328

Int. Cl.³ F16K *31/122, 31/53*

U.S. Cl. 251—58 **21 Claims**



1. An actuator for a valve, said valve including a valve body having a valve member disposed in said valve body with a first gear attached to said valve member, said actuator comprising:

a second gear means for drivingly engaging said first gear to operate said valve;

moving means for selectively moving said second gear means into and out of engagement with said first gear;

power means for driving said second gear means;

support member means constructed for attachment to said valve body;

frame means, rotatingly connected to said support member means so that said valve body may rotate relative to said frame means, said frame means also being attached to said moving means; and

locking means for selectively locking said frame means to said support member means prior to the operation of said valve to prevent said support member means from rotating relative to said frame means, said locking means including biasing means for biasing said locking means toward an unlocked position.

4,323,222
CONTROL SYSTEMS FOR HYDRAULICALLY OPERATED ELEMENTS CIRCUITS OR SYSTEMS

David F. Dempster, 1 Coniston Ave., Fleetwood, Lancashire, and John J. Wilson, 68 Church Rd., Thornton-Cleveleys, Lancashire, both of England

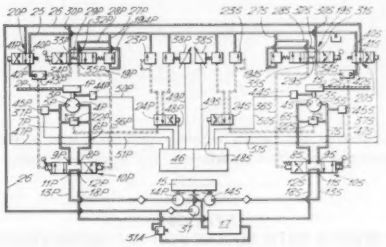
Filed Jun. 12, 1979, Ser. No. 47,739

Claims priority, application United Kingdom, Jun. 13, 1978, 26823/78

Int. Cl.³ B66D *1/08, 1/50*

U.S. Cl. 254—274 **10 Claims**

1. A control system for controlling hydraulically operated winch assemblies whose cables, wires or the like are intended to be connected with the same trawl or other form of net used for sea fishing or for use with other objects or in situations in which it is required to maintain predetermined tensions in the cables, wires or the like, the control system including means for enabling a number of reference pressure levels each indicative of a particular required operational condition for the cables, wires or the like; such as paying-out, continuous pull, hauling-in; separate means for monitoring the operational conditions of the winch assemblies; means for comparing the results of the monitoring with an associated one of said reference pressure levels thereby to provide associated operational condition indication signals; and control means so responsive to such signals as to cause independent corresponding variation of the operational conditions of the relevant winch assembly; said control system further comprising interference response means responsive to interference to a required movement of the common object, the interference responsive means including means for enabling paying-out of a predetermined additional length of cables, wires or the like; means for detect-



ing whether the interference still persists following the pay-out of the additional length of the cables, wires or the like and for arresting any such additional pay-out thereby to permit the tension conditions in the cables, wires or the like to increase to a predetermined higher level to enable application of increased force on the object connected thereto for the purposes of attempting forcibly to free the said object from the interference; and means for causing adjustment of the control means to allow further paying-out of the cable, wire or the like if said interference still persists so as to prevent said higher level being exceeded, and to provide an alarm signal indicative that the predetermined higher level had been attained and that the interference still persists.

4,323,223
APPARATUS FOR FORMING A CLOSED CUT SURFACE IN A WALL OF A WORKPIECE

Hans Noll, Leverkusen, Fed. Rep. of Germany, assignor to Maschinen- und Armaturen- J & W Müller, fabrik GmbH, Leverkusen, Fed. Rep. of Germany

Filed Mar. 23, 1981, Ser. No. 246,450

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011256

Int. Cl.³ B23K *7/04, 7/10*

U.S. Cl. 266—54 **12 Claims**

1. An apparatus for cutting a hole in a wall of a workpiece, said apparatus comprising

a carrier mounted for rotation about an axis perpendicular to said carrier;

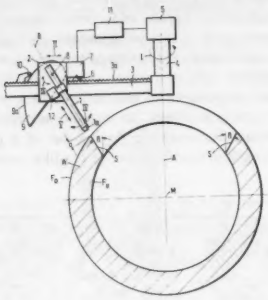
a burner adjustably mounted on said carrier and having a tip at one end;

first means for moving said burner along said carrier radially of said axis;

a computer connected to said means for controlling said means as a function of the rotation of said burner about said axis; and

second means for tilting said burner in a predetermined

program in a plane coincident with said carrier and said axis as a function of the radial movement of said burner



relative to said carrier whereby said tip is held at a constant distance from a surface of the workpiece wall.

4,323,224

GAS SPRING WITH MEANS FOR IMPEDING PISTON MOVEMENT AWAY FROM ONE TERMINAL POSITION

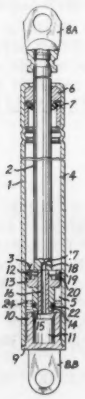
Herbert Freitag, Koblenz-Metternich, and Klaus Schnitzius, Rheinbrohl, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 938,228, Aug. 30, 1978, abandoned, which is a division of Ser. No. 791,011, Apr. 26, 1977, Pat. No. 4,166,612. This application Jul. 9, 1979, Ser. No. 55,826

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619176

Int. Cl.³ F16F 9/10

U.S. Cl. 267—64.12 **18 Claims**



1. A cylinder-and-piston device, comprising:

(a) a cylinder having an axis and defining a sealed cavity therein;

(b) a piston assembly axially movable in said cavity towards and away from a terminal position, and including:

(1) a piston axially dividing said cavity into first and second compartments;

(2) means defining a first passage extending axially across said piston for connecting said compartments when said assembly is remote from said terminal position;

(3) a piston rod fastened to said piston for joint movement therewith and extending from the piston through said first compartment and axially outward of said cavity;

(4) means defining a second passage extending axially across said piston for connecting said compartments; and

(5) valve means for closing said second passage, said valve means operating to close said second passage only in response to movement of said piston assembly away from said terminal position, said valve means opening said second passage in response to movement of said piston assembly towards said terminal position; and

(c) locking means carried in part by said cylinder in said cavity and in part by said piston assembly for closing said first passage when said piston assembly approaches said terminal position so that once said piston assembly is adjacent said terminal position, movement of said piston assembly away from said terminal position closes said second passage, thereby preventing fluid communication between said first and second compartments and thereby retaining said piston assembly adjacent said terminal position.

4,323,225

CIRCULAR FLUORESCENT LAMP MANUFACTURING APPARATUS

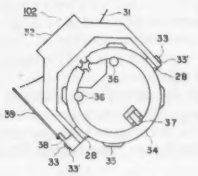
Shigeaki Saita, and Manabu Nakaoka, both of Ohme, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,161

Claims priority, application Japan, Aug. 24, 1979, 54-107263

Int. Cl.³ B25B 1/20

U.S. Cl. 269—43 **6 Claims**



1. A circular fluorescent lamp manufacturing apparatus comprising: a turntable supported for intermittent rotation at a fixed pitch; a plurality of bearing supporters bi-furcated at their outer ends, each outer end containing a bearing, said bearing supporters equi-distantly arranged on the outer circumferential part of said turntable; a rotary shaft means supported for rotation in said bearings between said bi-furcated outer ends in each bearing supporter; a pair of circular glass tube supporters arranged in parallel back to back and joined to each of said rotary shaft means so as to be rotable therewith; holding means for holding a circular glass tube on each of said circular glass tube supporters; and rotating means for intermittently rotating each of said rotating shafts in its bearings to thereby rotate said circular glass tube supporters through a plurality of stop positions.

4,323,226

CLAMP ASSEMBLY

Sam Close, R. R. #5, Box 312, Lebanon, Ind. 46052

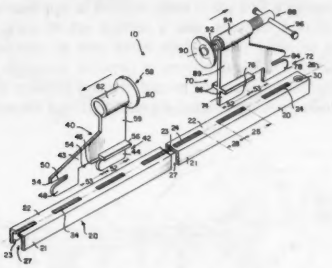
Filed Nov. 23, 1979, Ser. No. 96,831

Int. Cl.³ B25B 1/02

U.S. Cl. 269—208 **21 Claims**

1. An assembly for clamping a workpiece comprising a bracket including a plurality of equally spaced perforations in parallel relationship to each other and two workpiece-retaining members, each retaining member including means cooperating with the perforations for removably securing the members to the bracket in one of a plurality of spaced relationships, the securing means of each retaining member including first

and second fingers provided in a single plane and spaced apart in a relationship corresponding to the spaced relationship of the perforations, and two additional fingers, the two additional fingers being provided generally perpendicular to the plane of



the first and second fingers on one side of the retaining members and being spaced apart in a relationship corresponding to the spaced relationship of the perforations to allow the retaining member to be secured generally perpendicular to the plane of the perforations of the bracket.

4,323,227

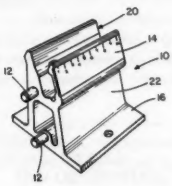
CONNECTOR FIXTURE

James A. Turek, LaGrange, Ill., assignor to Panduit Corp., Tinley Park, Ill.

Filed Feb. 22, 1980, Ser. No. 123,583

Int. Cl.³ B25B *1/00*

U.S. Cl. 269—254 R **8 Claims**



1. The combination of a fixture for holding a mass termination connector and said connector; said connector including a housing having a front wall and a back wall and further including a series of regularly spaced metal contact elements disposed intermediate said walls each of which comprises a substantially vertically disposed slotted plate extending generally parallel to said walls for displacing insulation of a conductor corresponding to said plate thereby to electrically terminate said conductor, said housing including first retention means disposed on the side of said plates remote from said back wall and second retention means disposed on the side of said plates remote from said front wall, said first and second retention means and said plates firmly retaining conductors prior to their termination by holding said conductors bent from their as-manufactured axial direction; said fixture comprising:

a base for mounting on a wiring board or the like; and

a channel-shaped holder joined to said base for holding said connector, said holder disposed tilted with respect to said base so that said plates are inclined relative to said wiring board whereby movement of a tensioned conductor extending between two connectors is resisted by corresponding inclined plates indenting the insulation of said conductor, said holder comprising a relatively rigid back support and a resilient front arm joined by a web, said front arm and back support holding said connector in an interference fit, said connector front wall including a plurality of spaced vertical ribs, said holder front arm carrying an inwardly directed tooth sized to fit between adjacent ribs to preclude substantial sideways movement of the mounted connector.

4,323,228

STRAIGHTENER FOR MOTOR VEHICLES

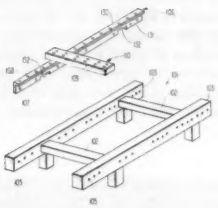
Horst Lutz, Ditzingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,635

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908672

Int. Cl.³ B21D *1/12*; B23Q *3/00*

U.S. Cl. 269—296 **10 Claims**



1. A straightener for motor vehicles, the straightener including a bench frame having a pair of spaced longitudinal support members interconnected by at least a pair of spaced transverse members, intermediate support members of a length at least substantially equal to that of the longitudinal support members, and cross support members constructed for supporting vehicle aligned adaptor elements, wherein said longitudinal support members are provided with a first hole pattern with a plurality of mounting holes provided at spaced intervals along the length of at least one lateral side thereof for enabling mounting of at least one of the cross support and intermediate support members, wherein said intermediate support members comprise an angle member having a first arm and a second arm disposed at a right angle with respect to each other, wherein said first arm of the intermediate support is provided with a plurality of holes arranged in said first hole pattern for mounting the intermediate support members parallel to the longitudinal support members and said second arm is provided with a plurality of holes arranged in a second hole pattern for enabling attachment of the cross support members thereto.

4,323,229

MACHINES FOR ASSEMBLING SHEETS OF LAMINAR MATERIAL SUCH AS PAPER

Roger R. Meus, Heusy, Belgium, assignor to Ordibel Sprl, Dolhain-Limbourg, Belgium

Continuation of Ser. No. 890,477, Mar. 27, 1978, abandoned, which is a continuation of Ser. No. 722,375, Sep. 13, 1976, abandoned. This application Dec. 5, 1979, Ser. No. 100,495

Claims priority, application Belgium, Sep. 15, 1975, 833436; Mar. 23, 1979, 839934

Int. Cl.³ B65H *39/04*

U.S. Cl. 270—58 **8 Claims**

1. In a machine for assembling sheets into bundles, said machine comprising:

a plurality of adjacent receptacles, for receiving a plurality of packets of sheets, arranged substantially parallel with each other, each of said packets contributing one of its sheets for each bundle to be assembled;

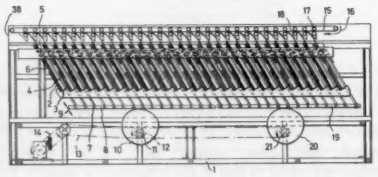
a plurality of reciprocating drive members for reciprocating in first and second reciprocating directions, each drive member being associated with one of said receptacles, each of said drive members for partially driving an upper sheet out of each of said packets received in said receptacles when moving in said first and second directions;

a single drive means for operating said plurality of reciprocating drive members;

a collecting member for simultaneously collecting said upper sheets when they have been partially driven out of said receptacles, said collecting member collecting said sheets as a train;

a receiving member for receiving said train of sheets and stacking said train as a bundle of assembled sheets, said machine being characterized by:

means dividing said plurality of drive members into at least two groups, said means including control means for selectively engaging said drive members in first, second and third alternative operating modes, in said first mode said control means engaging all groups of driving members with said drive means for simultaneous operating, in said second mode said control means engaging all groups of said drive members with said drive means for non-simultaneous operation, in said third mode said control means engaging less than all groups of said drive members with said drive means for operation, said non-simultaneous operation resulting in the provision of sub-trains of sheets for collection by said collecting member;



wherein each drive member has a longitudinal axis and a leading end, said leading end provided with a slider which is articulated on said leading end for rotation about a first axis substantially parallel to said longitudinal axis of said drive member and for rotation about a second axis substantially perpendicular to said longitudinal axis, said rotation about said second axis being between a contact position in which a part of said slider contacts said upper sheet when said drive member moves in said first direction and a non-driving position when said drive member moves in said second direction; and

wherein said part of said slider includes a friction member of rough material extending beyond said slider on a side remote from said drive member, and an electric nonconducting bulb fixed to said drive member, said bulb containing an electric switch comprising two metal blades, said slider further comprising an arm provided with a magnet, said arm rotating with said slider about said second axis, said magnet closing said switch by causing said blades to contact when said drive member is in said contact position and, alternatively, said switch being open and said blades not in contact when said drive member is in said non-driving position.

4,323,230

MACHINE FOR SEPARATING BILLS AND COUPONS

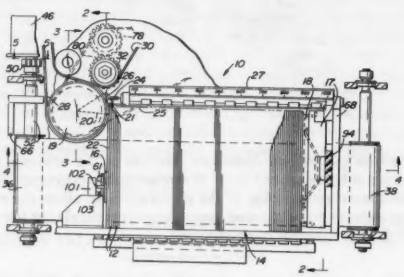
Robert P. Rising, Trumbull, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 10, 1979, Ser. No. 102,184
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—12 **13 Claims**

1. Apparatus for separating at high speeds one at a time bills and the like from a stack comprising:

means for holding a stack of bills including a first end element disposed to contact a portion of the outermost bill to be separated from said stack with the remaining portion having an exposed top portion allowing substantially zero force between the bills in said top portion of said stack to permit the application of a force thereto and a second end element disposed against the innermost bill of said stack and movable relative to said first end element,

means for maintaining said stack under low pressure as bills are removed therefrom including first and second pulleys, a belt disposed about said first and second pulleys, said belt having a first set of ends secured to opposite sides of said second element, and a second set of ends, spring means securing said second set of ends to each other, a source of electrical power, a pressure sensitive switch mechanically connected to said first end element actuated on when pressure exerted by said first end element falls



below a predetermined amount and off when pressure exerted by said first end element rises above said predetermined amount, motor means, said pressure sensitive switch electrically connected between said motor means and said source of electrical power for moving said second end element toward said first end element until said pressure sensitive switch is turned off,

means for applying a force only to said exposed portion of said outermost bill to separate it from said stack, and

means for transporting the separated bill away from said stack.

4,323,231

JUMPING BOARD

Robert M. Wilson, Vanceboro, N.C., assignor to Jump for Joy Ltd., Vanceboro, N.C.

Filed Nov. 7, 1980, Ser. No. 205,005
Int. Cl.³ A63B *5/18*
U.S. Cl. 272—65 **25 Claims**

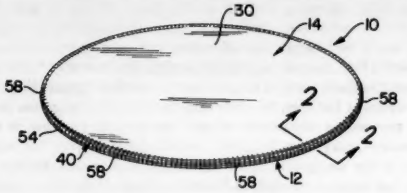
1. A jumping board comprising:

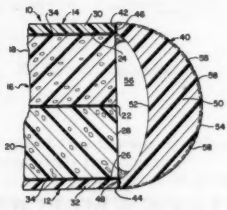
a resiliently deformable member of foam material having first and second oppositely disposed planar surfaces and a peripheral edge surface joining said first and second surfaces about the periphery of said deformable member;

first and second planar sheet members disposed in surface contact with and secured to said first and second surfaces of said deformable member, said first and second planar sheet members each having peripheral edge portions;

a resiliently deformable peripheral edge member for the periphery of said deformable member, said peripheral edge member having first and second spaced end edge portions and an intermediate body portion intermediate said first and second end edge portions, said first and second end edge portions being joined to said peripheral edge portions of said first and second planar sheet members, respectively, about the entire periphery thereof, and said intermediate body portion being spaced from said peripheral edge surface of said deformable member to define a hollow area between said peripheral edge surface of said deformable member and said edge member about the periphery of said deformable member, said intermediate body portion being sufficiently rigid to maintain a

substantially planar configuration for said jumping board when a person jumps thereon and being resiliently de-





formable to collapse and provide cushioning when a person jumps on said edge member of said jumping board.

4,323,232

EXERCISING METHOD

George I. Terpening, Telford, Pa., assignor to Acro Matic, Inc., Warrington, Pa.

Filed Sep. 26, 1977, Ser. No. 836,401

Int. Cl.[3] A63B *21/18, 21/30, 69/36, 69/38*

U.S. Cl. 272—68 **4 Claims**

1. A method of increasing the strength of a participant's grip involved in such activities as tennis or golf, by the application of localized pressure to the flexor capri ulnaris muscle at such participant's wrist just above the hand, comprising the steps of positioning a flexible, non-stretch strap about said wrist, which strap is provided with a protrusion mounted upon the inside of said strap for applying said localized pressure, applying pressure on said muscle by securing said strap in tension, and maintaining said tension by securing the free ends of said strap about said wrist during participation in said activities.

4,323,233

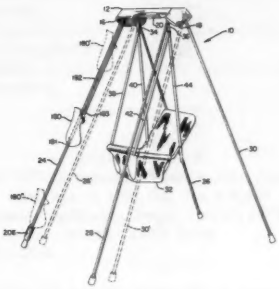
PENDULUM SWING

Albert W. Gebhard, Boulder, Colo., assignor to Gerico, Inc., Denver, Colo.

Continuation of Ser. No. 884,472, Mar. 8, 1978, abandoned. This application Aug. 6, 1980, Ser. No. 176,062

Int. Cl.[3] A63G *9/16*

U.S. Cl. 272—86 **18 Claims**



14. Swing apparatus, comprising:

a structural frame and support means for supporting said frame;

a main shaft extending transversely from the right to the left ends of said frame and journaled therein for rotation;

a right swing hanger and a left swing hanger, both of which are mounted between said ends of said frame, and a swing seat suspended from said right and left hangers;

actuator means for moving said swing in a pendulum motion, including weight-biased drive means having a drive weight for urging said shaft to rotate, escapement means for governing the rotation of said shaft, unidirectional clutch means for engaging said drive means with said shaft, and automatic rewind means for urging said drive means in a reverse rotational direction automatically in response to repositioning of said drive means to a position of potential energy usable for driving said swing; and

said drive means, escapement means, clutch means, and rewind means all being mounted concentric to a common longitudinal axis which is also common with the longitudinal axis of said main shaft.

4,323,234

JUMP REACH PHYSICAL TRAINING SYSTEM

Edna R. Glaese, 2243 Lakeside Dr., Moses Lake, Wash. 98837

Filed Sep. 2, 1980, Ser. No. 182,977

Int. Cl.[3] A63B *5/16;* **G06G** *1/02*

U.S. Cl. 272—93 **4 Claims**

1. A physical training system for measuring vertical distance jumped by an individual observed by a recorder between a reference point reached by the individual from an erect standing position adjacent an elevated support and the highest point observed by the recorder that is reached by the individual upon jumping upwardly, comprising:

a board having a front surface extending between end edges;

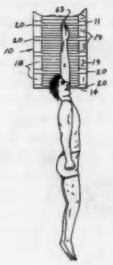
means on the board for attaching the board to the elevated support;

a visually perceptible full size scale on the front surface of the board arranged in vertical equally spaced successive groups of individual color coded increments with a reference character for each successive group, intermediate the end edges;

wherein the individual colored increments of one group match the colored increments of the remaining groups;

calculator means adapted to be held and operated by the recorder, including a base member and an indicator mem-

ber mounted thereto, with a proportionally reduced scale on one of the members in generally spaced groups of increments of matching color and reduced proportion from the full size scale on the board and with reference characters thereon matching the reference characters on the board, for recording an increment corresponding to



the increment on the board adjacent the reference point reached by the individual from the standing position, and for indicating to the recorder the vertical distance jumped as the recorder observes the highest increment on the board reached at the peak of the individual's jump and notes a corresponding increment on the calculator scale.

4,323,235

PHYSICAL TRAINING APPARATUS FOR HOLDING A PERSON'S FEET WHEN PERFORMING SIT-UPS

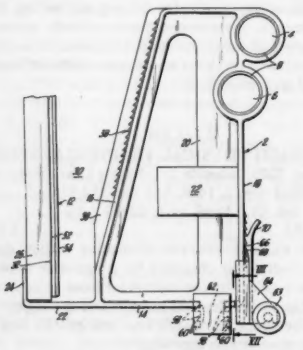
Gu ter Schwarz, Steinacherstr. 67, CH-8804 Au ZH, Switzerland

Filed Nov. 25, 1980, Ser. No. 210,291

Claims priority, application Switzerland, Feb. 14, 1980, 1189/80

Int. Cl.³ A63B *23/02*

U.S. Cl. 272—93 **14 Claims**



1. Physical training apparatus for holding a person's feet while the person lies on a horizontal floor to perform sit-ups and the feet are facing a closed, vertically extending door which forms an elongated opening between the bottom surface of the door and the floor, the apparatus being arranged to be fixed to the door, comprising a bar support member including a base portion which has a generally planar horizontal bottom surface to face the floor, said bar support member also having a first surface which extends vertically from the base portion and a second surface which is upwardly inclined from said base portion and converges toward said first surface to define an acute angle with a vertically extending line and to form a wedge-like space between said bar support member and the upwardly extending surface of the door, means on said bar support member for enabling at least one horizontally extending bar to be inserted in said bar support member to engage a person's feet, extension means extending horizontally from said second surface parallel to said bottom surface to pass through the opening between the door and the floor to engage the door for preventing movement of said bar support member in the direction away from the door, and a locking member for insertion in the wedge-like space to engage said second surface of said bar support member to fix the bar support member against movement in the direction toward the door when said locking member is at a locking position.

4,323,236

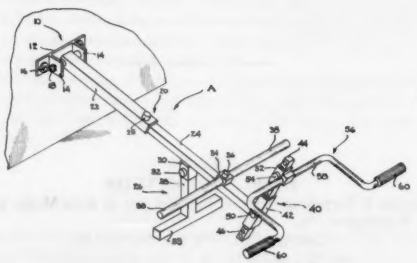
BODY EXERCISING WEIGHT APPARATUS

William Szabo, 8138 Foothill Blvd., Sunland, Calif. 91040

Filed Sep. 26, 1979, Ser. No. 79,095

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—117 **14 Claims**



1. A wall mountable body exercising apparatus comprising:

(a) a lever arm having first and second opposite ends;

(b) mounting means on a first end of said lever arm for pivotally mounting only said lever arm of said apparatus to a permanent relatively vertically positioned wall, said mounting means being the only portion of said apparatus mounted to any permanent structure such that the apparatus is pivotally mounted through only one pivot point,

(c) weight retaining means on said lever arm for removably retaining bar-bell type weights;

(d) a leg member depending from said lever arm and being engagable with a permanent relatively horizontally positioned floor to control the lowermost limit of movement of said lever arm;

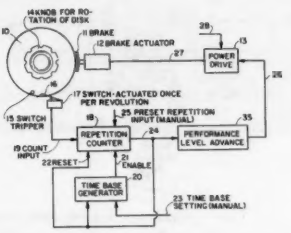
(e) adjustable positioning means at the second end of said lever arm, and

(f) handle means secured to said adjustable positioning means at the second end of said lever arm for engagement by the hands of a user of said body exercising apparatus so that a user may attempt to lift the second end of the lever arm about the pivot point at the mounting means against one or more bar-bell type weights placed on said weight retaining means, said adjustable positioning means permitting the height of said handle means to be adjustably positioned relative to said lever arm.

4,323,237
ADAPTIVE EXERCISE APPARATUS

Bernard R. Jungerwirth, Rego Park, N.Y., assignor to Coats and Clark, Inc., Stamford, Conn.

Filed Aug. 30, 1979, Ser. No. 71,057
Int. Cl.³ A63B 21/24
U.S. Cl. 272—131 **13 Claims**



1. An adaptive method for subjecting an individual to progressive exercise, comprising the steps of:

establishing the number of repetitions of an exercise to be performed against a resistance means in a desired time interval;

setting the magnitude of said resistance means and the length of said desired time interval at predetermined initial values;

sensing performance by said individual;

generating a level met signal as a function of sensed performance to indicate a first level of accomplishment if and when said established number of repetitions is performed within said desired time interval;

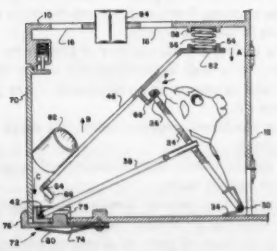
setting a higher level performance objective responsive to said level met signal by incrementally increasing the magnitude of said resistance means to a predetermined value greater than said initial value; and

thereafter repeating said level met signal generating and resistance means magnitude increasing steps to indicate and set successively higher levels of accomplishment and performance objectives respectively.

4,323,238
ACTION TOY REQUIRING SPACE PERCEPTION AND EYE/HAND COORDINATION

Hans E. I. Jernstrom, Barrington; Thomas L. Long, Arlington Heights, and Ronald Liedtke, Addison, all of Ill., assignors to Jernstrom Design Workshop, Inc., Palatine, Ill.

Filed Feb. 23, 1981, Ser. No. 236,790
Int. Cl.³ A63F 9/06
U.S. Cl. 273—1 G **12 Claims**



1. A toy comprising an enclosure pierced by a plurality of holes of distinctive geometry, a plurality of objects shaped to pass through individually associated ones of said distinctive holes, balance means inside said housing for receiving said objects as they pass through said holes, said balance means balancing the total weight of the received objects against a spring bias, and means responsive to a cumulative weight of all objects on said balancing means exceeding said bias for performing a surprise function with said toy.

12. A method of entertaining comprising the steps of:

(a) cocking a toy against at least one spring bias;

(b) matching distinctive geometrical shapes of a plurality of different objects and holes;

(c) detecting when a predetermined number of said shapes are matched;

(d) releasing said cocked toy to enable movement responsive to said spring bias; and

(e) performing a surprising display function responsive to said movement.

4,323,239
BASEBALL BAT

Junichi Ishii, 3C73, Kamihongo, Matsudo City, Japan

Filed Apr. 8, 1980, Ser. No. 138,042
Claims priority, application Japan, Apr. 17, 1979, 54-46981
Int. Cl.³ A63B 59/06
U.S. Cl. 273—72 A **7 Claims**

1. In a hollow baseball bat made of a rigid material and having an impact portion, a grip portion and a flexible bending portion positioned between said impact and grip portions and joining these two portions, the improvement comprising; a circular sectional reinforcing member having a tapered cavity extending along its longitudinal axis from an end face of said member on a side of said impact portion of said baseball bat toward said grip portion, said reinforcing member having a slightly bulged surface formed at its outer circumference on an end portion on the side of said impact portion, and the wall thickness of an end portion of said reinforcing member formed having said tapered cavity gradually reducing toward said impact portion in conjunction with said tapered cavity, said reinforcing member being disposed in said grip and flexible bending portions such that said reinforcing member is in close contact with at least an inner surface of said grip portion but forms a gap gradually diverging toward said impact portion between at least a part of an inner surface of said bending portion and an outer circumference of the end portion of said reinforcing member.

4,323,240
BOWLING GAME

Charles G. Stewart; Nellie R. Stewart, both of 8465 Village Dr.; Floyd E. Hicks, and Maxine Hicks, both of 43 New Uri, all of, Florence, Ky. 41042

Filed Aug. 20, 1980, Ser. No. 179,776
Int. Cl.³ A63F 7/06, 3/06
U.S. Cl. 273—85 R **3 Claims**

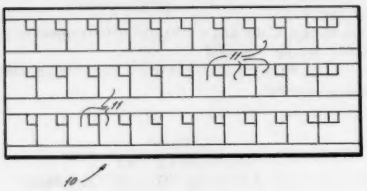
1. A bowling game comprising:

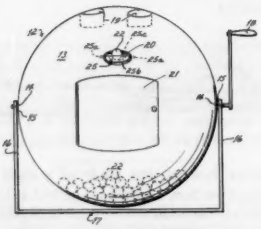
a variety of color-coded scorecards having a format similar to the format of a scoresheet for scoring a game of bowling, one of said scoresheets being distributed to each player among a group of players;

a number of tokens, ten of said tokens being colored each of said variety of different colors, each of said tokens of the same color being numbered with one of the numerals "1" to "10";

a bin into which said tokens are deposited for enabling a caller to randomly select said tokens from said bin for calling the color and number of each said randomly selected token;

whereby each time that the color called corresponds to the color of a player's scorecard, said player writes the number called as the first or second ball in a frame of one game on said player's scorecard, said game being ended when one player completes all frames of said game, all other players being required to complete unscored and partially scored frames by marking gutter balls, each player total-





ing the score of said game in accordance with the rules of bowling, so that the player with the highest score wins said game; and

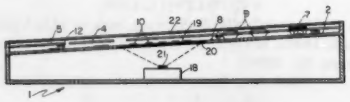
pegs and a tot board having holes into which said caller inserts said pegs for recording the colors and numbers of said randomly selected tokens as said game is played so that players' scorecards can be verified.

4,323,241

PINBALL GAME APPARATUS

Reinhard Deutsch, Gräfstrasse 47, 6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 15, 1980, Ser. No. 178,288
Int. Cl.³ A63F 7/00
U.S. Cl. 273—121 A **4 Claims**



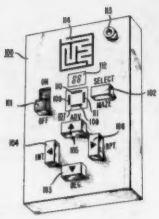
1. A pinball game apparatus with a housing of which the upper face is designed as a playing area with targets for a playing ball, at least one movable target being provided, an electrical system, said target forming the actuation means of an actuation switch in said electrical system, the playing area having an opening sealed by a matte pane, an image reproducing means, said image reproducing means being within said housing and including means for projecting different images onto said matte pane and a change stepper motor, said motor being in said electrical system and being adapted to change the image projected, each step of said motor being actuated by said switch.

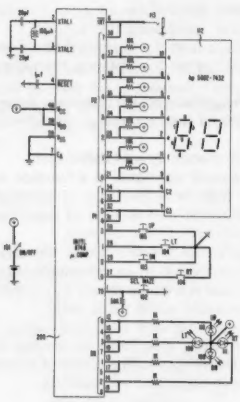
4,323,242

ELECTRONIC MAZE GAME

Peter E. Rosenfeld, 149 Mountain Ave., Berkeley Heights, N.J. 07922

Filed Sep. 23, 1980, Ser. No. 189,583
Int. Cl.³ A63F 9/06
U.S. Cl. 273—153 R **8 Claims**





1. An electronic maze game comprising:

means for storing an electronic representation of a maze of at least two dimensions;

means for storing an electronic representation of a player's present position in said maze;

means coupled to said means for storing an electronic representation of a maze for displaying for said present position the presence or absence of a wall in the forward direction and the backward direction for each dimension of the maze said displaying means including an array of pairs of display elements, one pair for each dimension of the maze;

means for moving from said present position to an adjacent position in said maze; and

means for testing for the validity of a move by testing for the presence of a wall in the direction of the move.

8. A method of operating an electronic maze game comprising the steps of:

storing an electronic representation of a maze of at least two dimentions;

storing an electronic representation of a player's present position in said maze;

displaying for said present position the presence or absence of a wall in the forward direction and the backward direction by an array of pairs of display elements, one pair for each dimension of the maze;

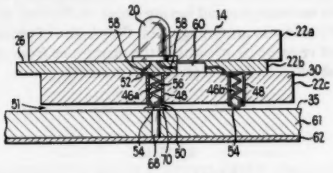
signifying an intended move from said present position to an adjacent position in said maze; and

testing for the validity of said intended move by testing for the presence of a wall in the direction of the move.

4,323,243
ELECTRICAL BOARD GAME DEVICE

Steven P. Hanson, Rancho Palos Verdes, Calif.; Howard J. Morrison, Deerfield, and Douglas P. Montague, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 20, 1980, Ser. No. 199,013
Int. Cl.[3] A63F 9/08
U.S. Cl. 273—153 S 11 Claims



3. A board game device comprising:

a housing having a playing surface with an electrical circuit including a plurality of separated electrical contact pairs located at spaced positions across said playing surface, a source of potential being connectable across said contact pairs;

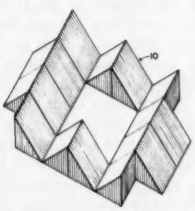
a plurality of elements retained on said playing surface on said housing in an abutting matrix for sliding movement relative to said housing and to each other along said surface in only two perpendicular paths, each element including an actuator means uniquely arranged on said element for changing the state of conduction across a contact pair when the element is located in a predetermined position on the playing surface; and

indicating means responsive to the changed state of conduction for indicating when each said element has been located in said predetermined position on said playing surface.

4,323,244
SOLID GEOMETRICAL PUZZLE METHOD OF ASSEMBLING MEANS

David W. Busing, 169 Mamaroneck Ave., White Plains, N.Y. 10601

Continuation-in-part of Ser. No. 947,465, Dec. 2, 1978, abandoned. This application Dec. 17, 1979, Ser. No. 103,901
Int. Cl.[3] A63F 9/08
U.S. Cl. 273—155 6 Claims



1. The method of assembling a solid geometrical puzzle comprising the steps of:

providing a puzzle surface of separate suitable configurations comprising a plurality of puzzle components and placing said puzzle components in a positioning jig,

applying a preprinted film to said surface to form hinges in predetermined locations between said components and specific graphic representations on the surface of said components, and

cutting the connection between particular components where hinges are not required and removing said puzzle from the jig in an assembled condition.

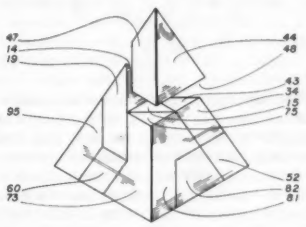
4. A solid geometrical puzzle comprising:

sixteen basic components, each having two triangular faces and three rectangular faces and hinged along two edges to adjacent components to form a continuous, closed chain of components in a configuration as illustrated in FIGS. 3 and 4 and wherein the rectangular faces comprise a square lower face, a square rear face at 90° to the lower face and an elongated rectangular face joining the free edges of the lower and rear face and the triangular faces comprise end isosceles triangles joining the free edges of the square and rectangular faces, said component size and hinging being such that the components may be folded to form a cube, an elongated rectangular solid, a flat rectangular solid and numerous irregular solids and wherein the components may be folded so that normally outside faces of the cube configuration may be totally concealed internally by folding to another rectangular solid form.

4,323,245
AMUSEMENT DEVICE FORMED OF A PLURALITY OF DIFFERENTLY SHAPED INTERFITTING MODULAR UNITS

Robert D. Beaman, 608 Beech Dr., Newport News, Va. 23601

Filed Feb. 24, 1981, Ser. No. 237,662
Int. Cl.[3] A63F 9/12
U.S. Cl. 273—157 R 29 Claims



1. A three-dimensional amusement apparatus comprising a first plurality of three-dimensional modular units, each having a different shape defined by a plurality of exterior planar surfaces and being formed by an integral combination of at least one equilateral solid tetrahedron in face to face contact with at least one equilateral solid octrahedron, the planar faces of each said solid tetrahedron having the same size and shape as the planar faces of each said solid octrahedron, said plurality of modular units being shaped to permit their interengagement to form a first tetrahedron having a predetermined size.

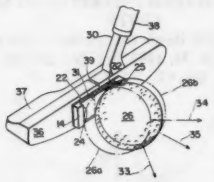
4,323,246
GOLF PRACTICE PUTTING AID

George M. Nehrbas, Jr., 218 Pershing Ave., Bethpage, N.Y. 11714

Filed Sep. 28, 1979, Ser. No. 79,835
Int. Cl.[3] A63B 69/36
U.S. Cl. 273—186 A 13 Claims

1. A golf practice putting aid for removably attaching to the substantially flat striking surface of the putter head of a putter normally used in playing a round of golf comprising a transversely extending backing member, the backing member having transversely spaced first and second end portions, spaced top and bottom portions and front and rear surfaces, first and second spaced upright rail means carried by the said front surface of the backing member and running continuously between the said top and bottom portions of the backing member, the first rail means extending substantially uniformly outward from the said front surface on the first end portion of the backing member, the second rail means extending substantially

uniformly outward from the said front surface on the second end portion of the backing member, the first rail means including elongated upright first angular surface means and the second rail means including elongated upright second angular surface means, the first and second angular surface means extending continuously between the said top and bottom portions of the backing member and being spaced substantially uniformly outward from the said front surface of the backing member, the first and second angular surface means also being substantially parallel and spaced outward from the front surface of the backing member at substantially the same distance, the first and second angular surface means being spaced apart transversely a distance sufficient to provide an upright medial surface area on the said front surface between the first and second rail means of a width which may be contacted with the circumferential surface of a golf ball without also contacting either of the first and second angular surface means, the said medial surface area on the front surface extending between the said top and bottom portions of the backing member and having a width between 3/16 inch and ⅜ inch, the first and second angular surface means being positioned on the first and second rail means respectively whereby the circumferential surface of



a golf ball contacting the said front surface outside of the said medial surface area also contacts at least one on the first and second angular surface means, the said rear surface of the backing member and the said medial surface area being substantially flat and parallel whereby the said rear surface conforms to the substantially flat striking face of a putter head and the said medial surface area serves as an extension of the striking face of the putter head that is visible to a golfer when practice putting, the said first and second angular surface means being substantially parallel to the said rear surface and also substantially the same distance therefrom and from each other whereby the width of the said medial surface area does not vary substantially, a tacky pressure sensitive adhesive carried by the said rear surface for securely but removably attaching the entire rear surface area thereof to the said striking face of a putter head whereby the attached putting aid does not noticeably vibrate and has a solid feel when the geometric center of the said medial surface area is struck by a golf ball, and the said putting aid being sufficiently light in weight so that it does not added noticeable weight to the said putter head and also does not noticeably change the center of gravity of the said putter head.

4,323,247

GOLF BALL COVER

Leonidas A. Keches, New Bedford; Sharon R. Goggin, Acushnet; Edward J. Isaac, Westport, and Ronald J. Rogers, New Bedford, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Jan. 19, 1981, Ser. No. 226,170
Int. Cl.[3] A63B *37/12*
U.S. Cl. 273—235 R **10 Claims**

1. In a golf ball comprising a core and a cover, the improvement comprising at least about 90% of said cover being composed of a triblend as follows:

(a) a first ionomer resin which is a copolymer of ethylene with methacrylic acid and having 34.8% free acid, about 9.5% total acid, about 2.1% sodium ions and an average melt flow index of about 0.9, said first resin being present in an amount of about 35% to about 60% by weight of the triblend;

(b) a second ionomer resin which is a copolymer of ethylene with methacrylic acid with about 48.9% free acid, about 1.8% zinc and an average melt flow index of about 0.7, said second resin being present in an amount of from about 15% to about 50% by weight of the triblend; and

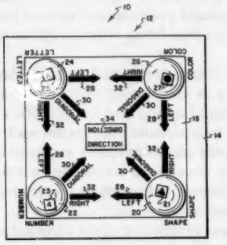
(c) a third ionomer resin which is a copolymer of ethylene with methacrylic acid having about 96.5% free acid, about 1.2% zinc and an average melt flow index of about 14, said third resin being present in the amount of from about 5% to about 35% by weight of the triblend.

4,323,248

BOARD GAME EMPLOYING CHANCE-TAKING MEANS

Salvatore L. Zingale, 12529 Longmead St., Cleveland, Ohio 44135

Filed Jan. 17, 1980, Ser. No. 113,063
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—236 **6 Claims**



1. Game apparatus comprising, in combination:

(a) a planar game board having four corners, the board having direction-indicating indicia for indicating possible player movements to be made away from the corners of the board, the direction-indicating indicia including, at each corner of the board, first and second arrows pointing to each adjacent corner of the board, and a third arrow pointing to the diagonally opposite corner of the board, the first, second, and third arrows being separately identified;

(b) direction-ordering apparatus for directing player movements away from the corners of the board in a given direction, the direction-ordering apparatus including a plurality of so-called directional cards placed at or near the center of the board, each directional card having indicia corresponding to one of the direction-indicating indicia, a total of 36 directional cards being provided;

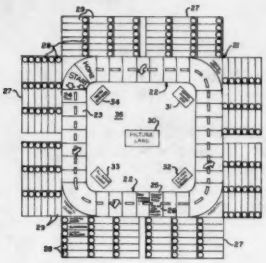
(c) chance-taking means included as part of the board, a separate chance-taking means being positioned at or near each corner of the board and adjacent the direction-indicating indicia, each chance-taking means permitting items within a different category of shape, number, letter, or color to be displayed at random, a given chance-taking means displaying different items within the same category, each chance-taking means including a die having six surfaces, each surface having a different indication of a common category of shape, number, letter, or color; and,

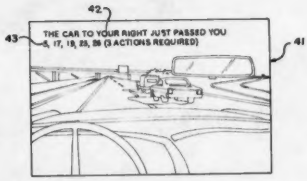
(d) a plurality of play cards having indicia on one surface, the indicia corresponding to the indications of shape, number, letter, and color included as part of the chance-taking means, a total of 48 play cards being provided for possible indicated items determined by the chance-taking means, two play cards corresponding to the items displayed on each die surface.

4,323,249
BOARD GAME APPARATUS

Hugh D. Brady, P.O. Box 607, Prescott, Ariz. 86301

Filed Jun. 16, 1980, Ser. No. 159,966
Int. Cl.[3] A63F 3/00, 9/18
U.S. Cl. 273—249 10 Claims



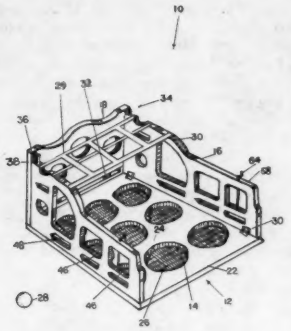


1. Board game apparatus comprising:
(a) one or more playing boards including playing areas;
(b) means dividing said playing areas into at least two sectors;
(c) the first said sector being a "driving" track around the center of a said board, said driving track including a plurality of "driving" lanes;
(d) first means partitioning each said driving lane into a plurality of first discrete areas, the number of said first discrete areas in each said lane being equal;
(e) second means partitioning the second said sector into a plurality of second discrete areas;
(f) a plurality of second indicia means that identify each said second discrete area, each said second indicia means including a unique tactic number in association with a unique described "defensive driving" tactic;
(g) a first plurality of illustrations, each said illustration depicting a unique vehicle traffic driving situation from the point of view of the driver, and, in association with each said illustration, a listing of the corresponding preferred "defensive driving" tactics called for by said unique vehicle traffic driving situation;
(h) at least two pluralities of game instruction cards, each plurality being adapted to be shuffled and stacked;
(i) a plurality of playing pieces adapted to be received in said first discrete areas, each said playing piece being visually distinguishable from each other said playing piece;
(j) a plurality of tokens adapted to be received in said second discrete areas;
(k) token indicia means for uniquely identifying and numbering each said token consecutively; and
(l) at least one die.

4,323,250
TARGET GAME

Delbert B. Lansberry, 211 S. Trask, Tampa, Fla. 33609

Filed Dec. 18, 1978, Ser. No. 970,452
Int. Cl.[3] A63F 7/00; A63B 63/04
U.S. Cl. 273—400 19 Claims



1. A target game comprised of ball missiles and a target element divided into a plurality of scoring sectors; a mesh attached to the underside of said scoring sectors; side frame members movable between an open and closed position attached to opposite sides of said scoring sectors a rear gate assembly movable between an open and closed position attached to the rear of said plurality of scoring sectors; and a first lock means to secure said side frame members to said rear gate assembly when said side frame members and said rear gate assembly are in said open position, said side frame members and said rear gate assembly cooperatively forming a retainer means to secure said ball missiles therein when said side frame members and said rear gate assembly are in said closed position, said retainer means comprises a plurality of apertures formed in said side frame members to form a seat to receive the lower portion of said ball missiles and a corresponding plurality of apertures formed in said rear gate assembly to receive the mid-portion of said ball missiles when in said closed position.

4,323,251
TARGET HOLDER

William A. Loveland, 904 66th. Ave. West, Bradenton, Fla. 33507; James S. Dukes, 8403 Byron La., Sarasota, Fla. 33580, and Gregory W. Sparks, 3701 19th St. West, Bradenton, Fla. 33505

Filed Feb. 13, 1980, Ser. No. 121,059
Int. Cl.[3] F41J 1/10
U.S. Cl. 273—407 2 Claims

1. A target holder for mounting a target comprising:
an elongated pole having one end terminating in a pointed end portion;

a cap secured to the other end of the elongated pole, said cap having two openings at a top end thereof;

a substantially circular metal frame with two radially outwardly projecting arm sections terminating in a bent end portion, said outwardly projecting end members disposed through the openings in said cap and restrained by the tension provided by the substantially circular frame; and

a plurality of means for securing the target, each means for securing being slidably mounted on the circular metal frame when the target is not secured, and being frictionally fixed to the circular metal frame when the target is secured, and said means for securing also having an integral piece of material having a first projecting member, a helical section that is wound around the frame with a predetermined minimal clearance at a predetermined level of compression, and a second projecting member, said first and second members being disposed on the same side of the frame and capable of being angularly displaced when the target is mounted so that the first projecting member originates below a plane defined by the target and terminates above the plane, and said second projecting member originates above the plane and terminates below the plane whereby the two projecting members are compressed against the target by a spring force generated by the helical section and the helical section is reduced in inside diameter and is frictionally fixed to the frame, whereby targets of different sizes can be mounted by sliding each means for securing to a desired position prior to mounting the target.

4,323,252

GLAND SEAL SYSTEM FOR USE WITH A METHANATION REACTOR

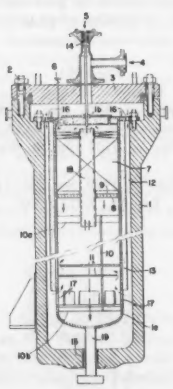
Vincenzo Lagana', Milan; Francesco Saviano, Segrate, and Stanislad Ferrantino, San Donato Milanese, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Division of Ser. No. 893,347, Apr. 4, 1978, Pat. No. 4,252,771. This application May 8, 1980, Ser. No. 148,193

Claims priority, application Italy, Apr. 15, 1977, 22499 A/77

Int. Cl.[3] **F16J** *15/14;* **B01J** *8/02;* **C07C** *29/16*

U.S. Cl. 277—12 **1 Claim**



1. In a methanation reactor having a reactor casing, an opening at one end of said casing, a discharge tube positioned within said opening for passing reacted gases from the interior of the reactor casing to the exterior thereof and seal means for sealing said tube at its point of passage through said reactor opening, the improvement of seal means comprising upper sealing means positioned in encircled relationship around the discharge tube at the exit point of said tube through the opening in said casing to form a tight seal between the opening and the tube, lower sealing means encircling said discharge tube in spaced relationship from said upper sealing means, bushing means in encircling relationship around said tube and positioned between said upper and lower sealing means, said bushing means having channel means formed therein through which water can enter and thereafter pass through and exit from said bushing means at a pressure greater than the internal pressure within the reactor casing and means for maintaining said upper and lower sealing means and said bushing means in a compressed state between the reactor casing opening and the discharge tube.

4,323,253

NOISE-INSULATING ENCLOSURE SEAL

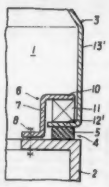
Colin T. Pomfret, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Jul. 21, 1980, Ser. No. 169,516

Claims priority, application Austria, Aug. 6, 1979, 5383/79

Int. Cl.[3] **F16J** *15/06;* **B65D** *53/06*

U.S. Cl. 277—12 **10 Claims**



1. A sealing element for a dividing gap between two parts which at least partly enclose a sealed space, comprising an elastic gasket element fitted in said gap, and a connecting device for connecting said two parts together, wherein an elastic initial tension element is provided between said connecting device and at least one of said two parts which at least partly enclose said sealed space, and said connecting device as well as said initial tension element is arranged within the interior of said sealed space.

4,323,254

SEALS OF THE TYPE DESIGNED TO ENSURE FLUID-TIGHTNESS BETWEEN TWO RINGS OF CONICAL BEARINGS

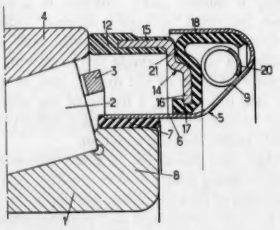
Jacques Bertin, Asnieres, France, assignor to Hutchinson-Mapa, Paris, France

Filed Apr. 14, 1980, Ser. No. 140,143

Claims priority, application France, Apr. 12, 1979, 79 09377

Int. Cl.[3] **F16J** *15/34*

U.S. Cl. 277—40 **8 Claims**



1. Seal for ensuring the fluid-tightness between first and second coaxial members one of which is rotatable with respect to the other around the common axis of the two members and whose relative axial positions are not determined with exactitude in advance, said seal comprising two coaxial annular

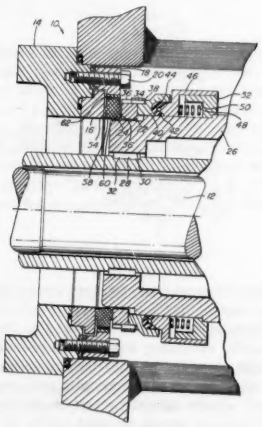
elements, namely a first annular element fast to the first member and a second annular element mounted on the first element so as to be axially movable with respect to the latter, means for applying said second element axially against the second member and means for ensuring fluid-tightness between the two elements, whatever their relative axial position, said means for applying the second element against the second member comprising a frustoconic bearing surface or the like fast to one of the two elements, the half-angle at the apex of the frustoconic bearing surface of the like being between 30° and 45° with respect to the seal axis, another bearing surface fast to the other element, and an annular spring mounted with extension on the frustoconic bearing surface and supported axially against the other bearing surface so as to urge these two bearing surfaces constantly into relative axial separation and to be rollable or slidable on the frustoconic bearing surface by changing in diameter during the relative axial movements of the two said bearing surfaces, said first annular element comprising a cylindrical section adapted to be sealingly engaged around an outer collar of an inner ring of a conical roller bearing, and joined thereto, a frustoconic section flared outwardly like the mouth of a trumpet, said frustoconic bearing surface being a surface of said frustoconic section, and said second element being mounted so as to be slidable with play along the cylindrical section of the first element.

4,323,255

MECHANICAL SEAL WITH ECCENTRIC SEAL FACES

Winfred J. Wiese, Los Angeles, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 13, 1979, Ser. No. 65,784
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—81 R **3 Claims**



1. In a mechanical seal assembly adapted to be associated with a rotatable shaft and a housing having a rotatable seal ring, a stationary seal ring and a central seal ring between the stationary and rotatable seal rings, the central seal ring having spaced faces which engage respectively a face of the stationary seal ring and the rotatable seal ring, the central seal ring being centered in a peripheral bearing therefor, the improvement which comprises:

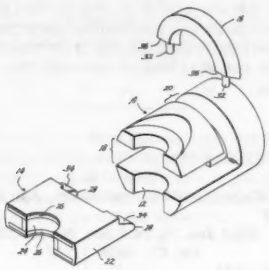
one seal face of one of said engaging seal faces being eccentric to the other engaging seal face.

4,323,256

FRONT PACKER SEAL FOR RAM BLOWOUT PREVENTER

Tosh Miyagishima, and Calvin Motoda, both of Los Angeles, Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed Apr. 30, 1980, Ser. No. 145,248
Int. Cl.³ E21B *33/06*
U.S. Cl. 277—126 **15 Claims**



1. An improved sealing means for a blowout preventer ram of the type which can be reciprocally moved into and out of engagement with a well conduit position in the blowout preventer and includes intersecting recesses formed in the outer surfaces of the ram body for accommodating resilient sealing means for forming a fluid pressure-tight seal around the well conduit and between the ram and a portion of a housing in which the ram moves when the ram operably engages the well conduit, the improvement comprising:

a front seal having a face with a curved portion shaped to engage the well conduit including a body portion formed of an elastomeric material shaped to fit within one of the recesses in the ram; and

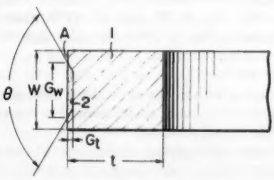
an insert formed of a deformable material with low friction properties and positioned in the body portion to engage the well conduit when the ram is in the well conduit engaging position, the insert being held between a pair of rigid retainer plates oriented perpendicular to the well conduit and embedded within the body portion of said front seal.

4,323,257

PISTON RING WITH A CR-C-FE INLAID RING IN ITS OUTER SURFACE, AND A METHOD OF MAKING IT

Katsumi Kondo; Yoshio Huwa, and Syouzi Miyazaki, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 2, 1979, Ser. No. 63,037
Claims priority, application Japan, Nov. 20, 1978, 53-143000
Int. Cl.³ F16J *9/00*
U.S. Cl. 277—224 **2 Claims**



1. A piston ring for use with a piston in an internal combustion engine prepared according to the process which comprises providing a cast iron piston ring preform having a circumfer-

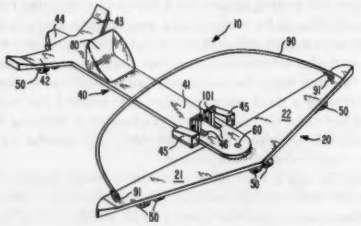
ential groove dividing its cylindrical outer surface into two cylindrical parts, said groove having a configuration such that the side walls slope outward from the bottom of said groove to the outer cylindrical surface of said preform so as to establish an angle between said side walls of 100° or more, plasma-spraying said piston ring preform with a deposit of an alloy comprising 55–70% Cr, 3–9% C and the balance substantially Fe so that the groove is filled up, and machining the outer surface of the ring so that any deposit of alloy on the cylindrical outer surface of the preform is removed and the deposit of the alloy in the groove is made flush with the cylindrical outer surface of the preform, said alloy being substantially free of any significant carbide.

4,323,258

CONVERTIBLE COASTER HAVING RUNNERS OR WHEELS

Michael L. Culpeper, 804 Greenfield Dr., Apt. 23, Lynchburg, Va. 24501

Filed Jan. 29, 1980, Ser. No. 116,589
Int. Cl.³ B62B *13/18*
U.S. Cl. 280—7.12 **6 Claims**



1. A moveable pivoted platform for supporting a rider in a variety of positions comprising;
a V-shaped front portion,
a generally T-shaped rear portion, comprising an elongated central member, having two opposed foot rests disposed proximate its forward end, and two opposed swept wing elements disposed proximate its rearward end,
wherein said rear portion supports a plurality of brake mechanisms, and the said front portion is pivotally connected to said rear portion at a position forward of said footrests, so that the pivoted arc of said front portion with respect to said rear portion is determined by the location of the foot rests which form an abutment on the elongated central member, and
said platform is supported by a plurality of removable wheel elements disposed on said portions.

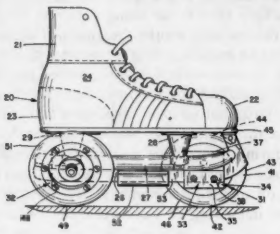
4,323,259

TWO WHEEL ROLLER ICE SKATE

Robert J. Boudreau, 176 Linden Ave., Malden, Mass. 02148

Continuation of Ser. No. 6,337, Jan. 25, 1979, abandoned. This application Oct. 3, 1980, Ser. No. 193,487
Int. Cl.³ A63C *17/06, 17/18*
U.S. Cl. 280—7.13 **2 Claims**

1. In combination with an ice shoe skate having an ice blade a two wheel roller ice skate attachment for converting said shoe ice skate into a roller skate:
said attachment comprising a pair of identical bracket clamps each having an elongated slot for receiving a portion of the blade of said skate;
clamp means on each said bracket clamp for detachably affixing one said bracket proximate the toe of said blade and the other said bracket proximate the heel of said blade;
an integral axle support arm on each said bracket extending upwardly and away from the slot therein at a predetermined angle;
an axle extending away from each said arm and normal thereto;
and a pair of rubber tired wheels, each rotatable on one of said axles;
one said bracket clamp being affixed along the toe portion of



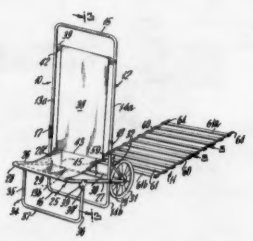
an ice skate blade with the wheel thereof canted outwardly on the inward side of the shoe and the other said bracket being affixed reversely along the heel portion of said ice skate blade with the wheel thereof canted outwardly on the outward side of the shoe;
the treads of said wheels overlapping laterally and defining a ground engaging path directly beneath and parallel to the longitudinal centre line of said shoe.

4,323,260

FOLDING CHAIR AND CART

Adalbert W. Suchy, 118 Saratoga Ave., Yonkers, N.Y. 10705

Filed Sep. 10, 1979, Ser. No. 74,245
Int. Cl.³ B62B *1/02*
U.S. Cl. 280—47.25 **8 Claims**



1. A folding chair and cart structure comprising a substantially vertical rectangular frame having interconnected top, bottom and vertical elements, an inclined U-shaped member having rearwardly extending legs, means pivoting said member to said frame at points spaced from the ends of said legs of said member to points on said vertical frame spaced from the bottom thereof, wheels carried by and inside the ends of said legs, foldable support means pivoted solely to the forward portion of said U-shaped frame member and extending downwardly therefrom, means coupling each leg of the first said U-shaped member to said vertical frame by a longitudinally adjustable diagonally disposed bracket comprising adjustable telescoping portions with one portion removably secured to the vertical frame and the other portion pivotally secured to a leg of said U-shaped member to permit the vertical frame to be adjusted to any one of a plurality of inclined positions, and a sheet of flexible material secured at one end to the upper portion of said vertical frame and at the other end to the forward portion of the first said U-shaped member to form a seat, said structure functioning as a cart when said vertical frame is tilted

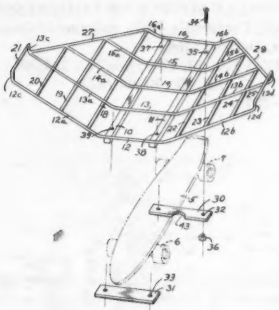
to the horizontal position with the top of the frame functioning as a handle, said wheels being carried by an axle extending between the legs of the first said U-shaped member, said diagonally disposed brackets each comprising a first cylindrical portion having a plurality of notches therein, a second cylindrical portion having a transverse slot slidably engaging the first cylindrical portion and a rotatable U-shaped spring having a pair of legs and a substantially straight portion extending from the end of one leg of said U-shaped spring toward the other leg and a hook carried at the end of said other leg of said U-shaped spring and engaging said straight portion, said straight portion being disposed in said slot and engaging a selected notch, said spring means being rotatable to disengage and engage selected notches to adjust the length of the associated bracket.

4,323,261

FRAME FOR SKATE BOARD

Harold Samuelson, 708 N. Valley Forge Rd., B-7, Lansdale, Pa. 19446

Filed Jul. 16, 1980, Ser. No. 169,299
Int. Cl.³ B62D *11/00*
U.S. Cl. 280—87.04 A **7 Claims**



1. A framework for removable attachment to a skate board which comprises two spaced apart parallel bars to receive a board between them, a plurality of parallel transverse rods having their mid portions fastened to said bars to form a flat bed for a skater to ride on and having upwardly and outwardly inclined side portions to define a shallow channel, a plurality of longitudinal rods disposed parallel to said bars and connected to and tieing together the inclined portions to thereby form a grid, and means for temporarily attaching the frame to a skate board.

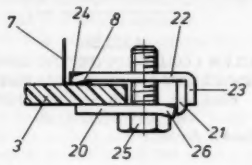
4,323,262

UNIVERSAL MUDGUARD FLAP AND CLAMP FOR MOTOR VEHICLES

Knut Arenhold, Westend 7, 2000 Hamburg 52, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,403
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851748; Feb. 15, 1979, 2905753
Int. Cl.³ B62D *25/16*
U.S. Cl. 280—154.5 R **20 Claims**

1. In a combination of a universal mudguard flap for motor vehicles and at least one clamp for attaching the flap to the fender fold of the vehicle, wherein the mudguard flap comprises a main body flap, an adapter protrusion at the top thereof to align the mudguard flap with the contours of the vehicle chassis, and an upper edge on the main body flap which joins with an inner edge of the adapter protrusion, and wherein the clamp has an open end, which is engagable with the said upper edge of the main body flap and an adjacent portion of the fender fold, and a closed end spaced from the open end, the improvement comprising a clamp having generally two parallel clamping jaws held together by at least one bolt, the closed end having a first crosspiece projecting generally perpendicularly from the end of one of the jaws and abutting the end of the other jaw and a second crosspiece projecting generally



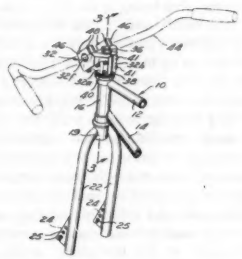
perpendicularly from the end of the other jaw and disposed in a contacting and generally overlapping parallel relationship with the said first crosspiece, and at least one jaw at the open end having at least one bent over corner end area wherein the direction of the bend is toward the other jaw.

4,323,263

BICYCLE FRONT FORK ASSEMBLY

Craig A. Cook, 4810 Park Newport, Newport Beach, Calif. 92627, and Gary B. Cook, 26871 Avenido Domingo, Mission Viejo, Calif. 92675

Filed Feb. 15, 1980, Ser. No. 121,876
Int. Cl.³ B62K *21/14*
U.S. Cl. 280—279 **2 Claims**



1. A bicycle front fork and handlebar support assembly comprising:

a bicycle front fork having an elongated cylindrical steer tube joined at its lower end to a pair of spaced downwardly extending legs for receiving the front wheel of a bicycle;

a bicycle frame head tube rotatably supported on said steer tube with the upper end of said steer tube extending above said head tube;

clamp means surrounding and connected to the upper end of said steer tube, said clamp means including a clamp-like bracket positioned on the upper end of said steer tube having a cylindrical portion that surrounds most of said steer tube and terminates in a pair of spaced jaw-like portions, and a pair of vertically spaced threaded fasteners for drawing said jaw-like portions towards each other to grip said steer tube and securely hold the bracket on the steer tube; and

a pair of support bosses formed on said bracket integral with said cylindrical portion having recesses defining a horizontal axis for receiving a horizontal portion of a handlebar, retainer means connected to said bosses for clamping said handlebar to said bracket, said support bosses being located on said bracket spaced from said jaw-like portions so that the handlebar is positioned on the opposite side of the steer tube from said jaw-like portions, said bosses including portions extending laterally from said bracket

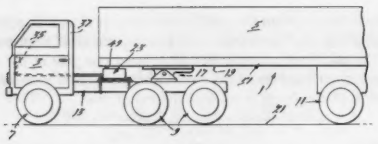
cylindrical portion on opposite sides of the cylindrical portion to straddle said steer tube such that the horizontal axis defined by said recesses is located close to the vertical axis of said cylindrical portion thus enabling the handlebar to be mounted close to said steer tube.

4,323,264

TRAILER LOAD SUPPORTING ASSEMBLY

Michael F. Paielli, 4070 Longtin, Lincoln Park, Mich. 48146

Filed Apr. 3, 1980, Ser. No. 136,494
Int. Cl.³ B62D *53/04*
U.S. Cl. 280—405 A **3 Claims**



1. A trailer load supporting device for mounting on the longitudinal side rails of a truck tractor frame in a position ahead of the fifth wheel and adapted to selectively engage the bottom of a trailer connected to the fifth wheel and exert a selected support load against it comprising a housing having a base member to rest on top of said side rails and a top member to engage the bottom of said trailer, said base member including transverse arms to extend along the side rails and providing means for securing the housing in fixed position on said side rails, said top member being in the form of an inverted pan with peripheral side walls and a first horizontal wall extending between the side walls and providing a closed top side, said top member having an open bottom side receiving the base member so that the base member is telescoped inside of the top member, said base member having a second horizontal wall parallel to said first horizontal wall, the space between said horizontal walls and the overall vertical dimension of the housing varying in height in accordance with telescopic movement of the top member on the base member, and said space being substantially closed by said members during telescopic movement thereof, and inflatable air bag means in the space between the top and bottom housing members for applying a selected pressure to the horizontal walls of the respective members tending to separate them and increase the height of said space and housing and to provide means for applying a lifting load to the bottom of a trailer, said bottom member having a channel-like H-shaped cross section with a web extending between side legs thereof and forming said horizontal wall.

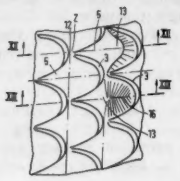
4,323,265

CROSS COUNTRY SKI

Wolfgang Benner, Kirchberg, Fed. Rep. of Germany, assignor to Benner Ski KG, Kirchberg, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,350
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1978, 2824714
Int. Cl.³ A63C *7/06*
U.S. Cl. 280—604 **12 Claims**

1. A cross country ski having a running surface profiled along at least a central portion of the length thereof, the profiling comprising a plurality of indentations in a scale-like pattern, said indentations being arranged in transverse offset rows and having essentially curved edges with the apex of the curved edge toward the point of the ski, the bottom surfaces of the indentations extending in relation to the running surface plane such that said indentations have the greatest depth in the area of the apices of the curved edges, the bottom surfaces of said indentations having sections with different inclination such that at least the areas of the section adjacent to the apices of the curved edges have substantially the same depth as the apex of the curve, the bottom surface of each indentation having a front area transverse to the length of the ski comprising a bucket-shape (9) connecting to the apex of a curved edge



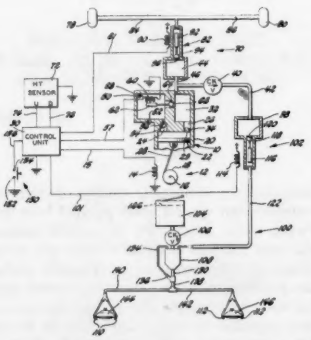
(3), and wherein the deepest point is approximately ⅓ to ½ the length of said indentation, and wherein a straight or convex rear area on the bucket-shaped area connects to the running surface plane (5).

4,323,266

MOTOR VEHICLE PRIORITY CONTROL SYSTEM FOR OPERATING LEVELING AND WASHING SYSTEMS FROM A SINGLE SOURCE OF COMPRESSED AIR

Jack W. Savage, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1981, Ser. No. 234,368
Int. Cl.³ B60G *11/26*
U.S. Cl. 280—707 **4 Claims**



1. In a motor vehicle, a controller for operating a pressurized washer system and a leveling system from a single electrically energizable air compressor wherein compressed air in said leveling system is adapted to be exhausted to atmospheric pressure through the air intake of said compressor, said controller comprising:

supply lines connecting said compressor to said leveling system and to said washer system;

electrically energizable blocker valve means in the supply line between said compressor and said leveling system effective to control the connection of said compressor to said leveling system;

first control means responsive to the level of the sprung mass of said motor vehicle for generating up or down commands for said leveling system, said leveling system being operative at times to energize said compressor and open said blocker valve means in response to an up command to raise the level of said vehicle, and to deenergize said compressor and open said blocker valve means in response to a down command to lower the level of said vehicle by exhausting air through the air intake of said compressor;

second control means selectively actuable to generate a wash command for said washer system, said washer system being operative at times to energize said compressor

in response to a wash command for dispensing a cleansing solution onto a motor vehicle surface; and

means for controlling the energization of said blocker valve means and said compressor as a function of the commands generated by said first and second control means in a manner to service said commands according to a predetermined priority wherein either said blocker valve means or said compressor is disabled in response to a command that is given priority so that said leveling system and said washer system will not interact when a down command and a wash command are generated concurrently.

4,323,267

PASSIVE VEHICLE SEAT BELT SYSTEM

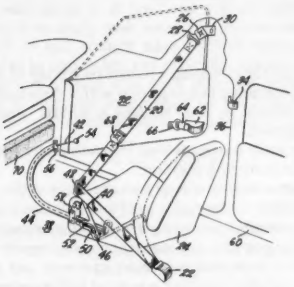
Juichiro Takada, 3-12-1 Shinmachi Setagayaku, Tokyo, Japan

Filed Mar. 31, 1980, Ser. No. 135,993

Claims priority, application Japan, Mar. 29, 1979, 54-039999[U]

Int. Cl.³ B60R *21/02*

U.S. Cl. 280—803 **8 Claims**



1. A passive vehicle occupant restraint system comprising a first emergency locking belt retractor affixed adjacent the lower rear of the inboard side of the vehicle seat; a shoulder belt leading from the first retractor upwardly and outwardly across the seat and fastened to the upper rear corner portion of the door and thus being adapted to shift between a restraining position when the door is closed and a releasing position when the door is opened; coupling receiving means secured to the shoulder belt at a location such that it is located adjacent the rear of the inboard side of the seat when the shoulder belt is in the restraining position; a second emergency locking retractor affixed adjacent the lower rear of the outboard side of the seat, at least when the vehicle door is closed; a waist belt wound onto the second retractor; and coupling means on the waist belt for releasably connecting the waist belt to the coupling receiving means on the shoulder belt while the shoulder belt remains connected between the first retractor and the vehicle door.

4,323,268

ROTARY PIPE JOINT

Lee E. Wilson, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Division of Ser. No. 912,489, Jun. 5, 1978, Pat. No. 4,234,215. This application Apr. 7, 1980, Ser. No. 138,138

Int. Cl.³ F16L *53/00*

U.S. Cl. 285—41 **24 Claims**

1. A rotary pipe joint having a cooled pressure seal, comprising:

(a) a first tubular member having,

(i) a fluid transmission port disposed through the wall of said first tubular member,

(ii) a first set of heat transfer fins joined to the exterior of said first tubular member,

(iii) a second set of heat transfer fins joined to the exterior of said first tubular member and disposed at the opposite end of said first tubular member from said first set of heat transfer fins,

(b) a second tubular member disposed substantially within said first tubular member comprising,

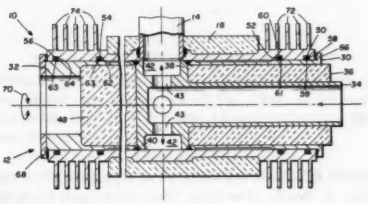
(i) an outer tubular member disposed adjacent the interior surface of said first tubular member,

(ii) an inner tubular member spaced inside of and coaxial with said outer tubular member,

(iii) a first flange joining said outer tubular member to said inner tubular member,

(iv) a second flange joined to said first flange to form an annular cavity in fluid communication with said first fluid transmission port in said first tubular member,

(v) fluid communication means transversely disposed



through said inner tubular member for connecting the interior of said inner tubular member to said annular cavity,

(vi) a third tubular member joined to said second flange, coaxial with said outer tubular member, and adjacent the interior surface of said first tubular member,

(c) a first sealing ring disposed between the inner surface of said first tubular member and the outer surface of said second tubular member, coaxial with said first tubular member and disposed essentially adjacent said first set of heat transfer fins, and

(d) a second sealing ring disposed between the inner surface of said first tubular member and the outer surface of said second tubular member, coaxial with said first tubular member and disposed essentially adjacent said second set of heat transfer fins.

4,323,269

COAXIAL COUPLING SYSTEM

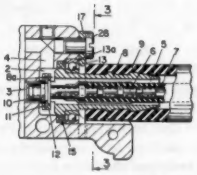
Roger Pellenc, Pertuis, France, assignor to Etablissements Pellenc & Motte, Pertuis, France

Filed Mar. 6, 1979, Ser. No. 18,038

Claims priority, application France, Mar. 9, 1978, 78 07383

Int. Cl.³ F16L *39/00*

U.S. Cl. 285—133 R **19 Claims**



1. A secure and easily dismountable coupling system for use with a hydraulically powered device, said device being adapted to be operated by a high pressure hydraulic fluid, said coupling system permitting the rotation of said device relative to said system, said coupling system comprising:

(a) an outer hose pipe adapted to have a hose attached

thereto on one end of said outer hose pipe, and adapted to be fitted within a body associated with said device, journal means adapted to permit rotation of the entire outer hose pipe relative to said device disposed around the outside of said outer hose pipe and adapted to be positioned between said outer hose pipe and said body;

(b) an inner hose pipe adapted to have a hose attached to one end thereof, wherein said inner hose pipe is held within said outer hose pipe by means of a circlip;

(c) at least one lateral port in said outer hose pipe positioned between said one end of said inner hose pipe on which said hose is to be attached and said circlip, said port being adapted to permit fluid to pass therethrough; and

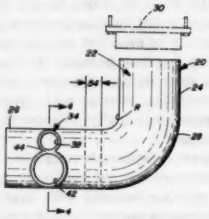
(d) means for attaching said coupling system to said hydraulically powered device.

4,323,270

PIPE FITTING DEVICE FOR PLUMBING SYSTEMS

James A. Brock, 2166 West Blvd., Cleveland, Ohio 44102

Filed Jun. 26, 1980, Ser. No. 163,107
Int. Cl.³ F16L *41/02*
U.S. Cl. 285—153 **4 Claims**



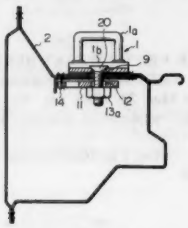
1. A plumbing fitting device for use in carrying waste materials from lavatories, bath tubs, sinks or the like comprising a one-piece body member made from a polymeric material having an inlet end and an outlet end with the inlet end adapted to be removably connected to a water closet or the like and with the outlet end adapted to be connected to a vent stack or the like, said body member being of a generally L-shaped configuration having an upright straight portion and a horizontally extending portion connected integrally together by a bend portion, said body member including a transversely extending hub section made integral in said horizontal section and having a transverse cross-section so as to be disposed within the peripheral confines of said horizontal section, said hub section including two pair of oppositely disposed ports, said ports being disposed entirely within the transverse dimensions of said hub section, said hub section being circular in transverse section and including transversely extending web portions that define passageways that terminate outwardly of said hub section in said ports, each of said oppositely disposed pairs of ports including an enlarged diamater lower port and a reduced diameter upper port, said upper and lower ports together defining a generally figure-eight configuration inside elevation, said upper ports being disposed above the longitudinal center line of the horizontal portion of said fitting with said lower ports being disposed below said center line such that said upper ports can be adapted as a vent to prevent siphoning of the system.

4,323,271

STRUCTURE FOR MOUNTING A STRIKER ON A VEHICLE BODY

Tomio Taniguchi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 30, 1980, Ser. No. 164,914
Claims priority, application Japan, Jul. 11, 1979, 54-94496[U]
Int. Cl.³ E05C *13/00*
U.S. Cl. 292—341.18 **5 Claims**



1. A structure for mounting a striker on a body of a vehicle, said striker cooperating and engaging with a door lock mechanism of said vehicle so that the door is locked, wherein said structure comprises,

said vehicle body having at least two bolt insert apertures at the striker mounting position;

a plate member having at least two apertures at the positions corresponding to the positions of said bolt insert apertures, said plate member having nuts welded thereto around said bolt insert apertures and at least one weld position which is distanced from said bolt insert apertures and at which position said plate member is welded to the striker mounting position of said vehicle body;

said plate member being provided with at least one deformable portion which connects said weld position to said nut positions of said plate member, so that said striker mounting position can be adjusted by the deformation of said deformable portion when said striker is mounted on said vehicle body by means of bolts which are engaged with said nuts.

4,323,272

EXCREMENT PICKUP DEVICE

J. Paul Fortier, 6220 Dartmouth Ave. N., St. Petersburg, Fla. 33710

Filed Feb. 15, 1980, Ser. No. 121,677
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 BA **11 Claims**

1. In a hand portable device for picking up and transporting animal excrement and the like, the combination of

(a) a pair of rods fixed sufficiently close together at one end to form a handle portion for grasping with one hand about both said rods and normally extending outwardly in the

form of a V with capacity for deflection toward each other by pressure of said hand against said rods at said handle portion,

(b) a bag support member extending from the other end of and transversely to each of said rods and adapted for mounting thereto the respective sides of a bag in a manner that the closed bag end will extend beyond said bag support members on the handle portion side of said support members and and adjacent to the support member side of said rods and with the open end of said bag terminating at the side of said support members opposite said handle portion,

(c) each of said bag support members having two substantially parallel width portions and two opposed length portions, one of said length portions being a straight edge portion at the respective bag support member's most distant extremity from said handle portion and extending transversely from the associated rod to form said bag open end terminating side of the respective support member opposite said handle portion, said straight edge portion and width portions being in substantially a single plane and said plane of at least one of said support members being at an angle with respect to its associated rod, and

(d) each of said straight edge portions being substantially parallel to each other and moveable toward each other to make line contact with each other by deflection of said rods in response to pressure of said hand against said handle portion for thereby closing said open end of said bag.

4,323,273

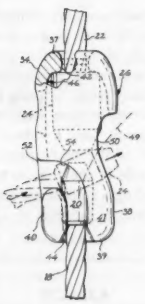
LINE ENDER

Alexander F. Sword, P.O. Box 27, Vernonia, Oreg. 97064

Filed Aug. 18, 1980, Ser. No. 179,067

Int. Cl.³ B66C *1/14*

U.S. Cl. 294—78 R **4 Claims**



1. A line ender for use in connecting a hauling line terminating at a nubbin and another line terminating at a nubbin, said ender comprising

an elongate body,

an elongate chamber extending axially within said body,

the walls of said chamber adjacent an upper end of said body being substantially circumferentially continuous and shaped to define an upper cup-shaped seat for the nubbin located at the end of the hauling line, said body having an upper bore extending axially therethrough connecting with the base of said seat through which the hauling line is adapted to pass,

the walls of said chamber adjacent the lower end of said body being shaped to define a lower seat for the nubbin located at the end of the other line, said body having a lower bore extending axially therethrough connecting with said lower seat through which, the other line is adapted to pass,

a first opening in one side of said body connecting with said chamber and being of a size enabling the nubbin of the hauling line to move therethrough in the process of seating such nubbin in said upper seat,

a second opening in the opposite side of said body connecting with said chamber, transversely aligned with a lower portion of said first opening, said second opening and the lower portion of said first opening being of sizes enabling the nubbin of the other line to be passed transversely through said body, with the nubbin of the hauling line seated in said upper seat, and

an entry slot on the lower portion of said body extending from one of said openings to said lower bore in a path extending along the side of said body which revolves substantially about a quarter of the circumference of the body, said slot connecting said chamber with the exterior of said body and providing entry of the other line into said lower bore.

4,323,274

REAR FOR A PASSENGER CAR

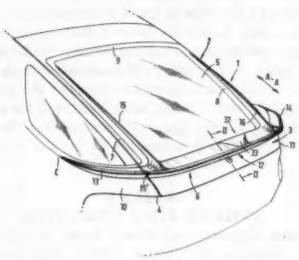
Richard Söderberg, Möglingen; Steven Winter, Hemmingen, and Hermann Burst, Rutesheim, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 28, 1980, Ser. No. 144,276

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 7912264[U]

Int. Cl.³ B62D *37/02*

U.S. Cl. 296—1 S **4 Claims**



1. Rear for passenger automobiles comprising a pivotable hatch inserted in an opening of a vehicle body, said body extending in a smoothly flowing line toward the rear, said hatch including a window, a transversely extending lower frame of the hatch, adjoining tthe window, being bounded by lateral body parts extending obliquely to the driving direction, characterized in that an aerodynamic device is provided on the lower frame of the hatch, said device having sections extended laterally from the hatch along the lateral body parts, wherein the aerodynamic device is comprised of an elastic member, wherein the elastic member has a recess on a side facing the lower frame of the hatch, this recess being delimited at least along certain sections by a bracket, said bracket being provided with a holding fixture serving for attaching the aerodynamic device to the lower frame, characterized in that the holding fixture has a generally hat-shaped profile in cross section.

4,323,275

SUN VISOR WITH AUXILIARY VISORS

Rainer M. Lutz, Reichberg 29 - (Postfach 32), D-7827 Löffingen, Fed. Rep. of Germany

Filed Aug. 8, 1979, Ser. No. 65,007

Int. Cl.³ B60J *3/00*

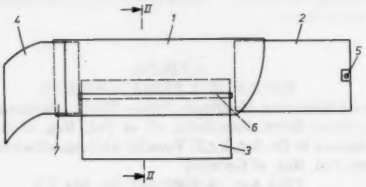
U.S. Cl. 296—97 G **12 Claims**

1. In a supplemental glare shield assembly adapted for association with a motor vehicle sun visor pivotally mounted for

rotation about a generally horizontal axis and selectively positionable for shielding the head region of a person occupying the front seat of the vehicle, the combination of:

a housing being detachably connected to the sun visor and swingable therewith and having a hollow interior with groovings in the interior walls and having slotted end and front walls,

a primary outboard auxiliary visor storable within the housing interior and being selectively withdrawable laterally from the housing interior via the grooving and through the slot of one of the housing end walls and having a curvature for projection to a desired extended position over a side of the vehicle for supplementing the shielding of the occupant forwardly and at one side thereof,



a secondary inboard auxiliary visor storable within the housing interior and being selectively withdrawable laterally from the housing interior via the grooving and through the slot of the other of the housing end walls for projection to a desired extended position toward the center of the front of the vehicle for supplementing the shielding of the occupant forwardly thereof, and

a tertiary auxiliary visor storable within the housing interior and being selectively withdrawable vertically downwardly from the housing interior via the grooving and through the slot in the housing front wall for projection to a desired extended position intercepting the occupant's zone of visibility downwardly of the sun visor.

4,323,276

VEHICLE ROOF STRUCTURE

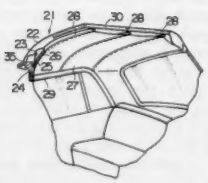
Kazumi Hira, Fijisawa, and Masao Tasho, Kamakura, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Aug. 13, 1980, Ser. No. 177,827

Claims priority, application Japan, Aug. 17, 1979, 54-113697[U]

Int. Cl.³ B62D *25/06*

U.S. Cl. 296—214 **8 Claims**



1. A vehicle roof structure comprising:

a roof panel having a pair of spaced, parallel marginal portions each formed with a plurality of openings which are disposed at spacings from each other in a direction subustantially parallel with said marginal portions;

at least one set of anchors arranged on one of said marginal portions;

a plurality of listing wires spaced apart substantially in parallel from each other and anchored at their opposite end portions to said marginal portions with said anchors interposed between at least one end portions of said listing wires and one of said marginal portions of said roof panel; and

a head lining suspended by said listing wires underneath said roof panel;

each of said anchors including a bored portion formed with an axial bore which is open at one end of the bored portion and which has one end portion of each of said listing wires fitted thereinto, an abutment portion formed at the other end of said bored portion in abutting engagement with said marginal portion, a non-circular portion disposed adjacent to said abutment portion and having a non-circular cross section shaped substantially in conformity to and in mating engagement with said opening, and a projecting portion protruding from said non-circular portion.

4,323,277

VEHICLE ROOF WITH A CUTOUT TO ACCEPT A COVER AND METHOD FOR ITS MANUFACTURE

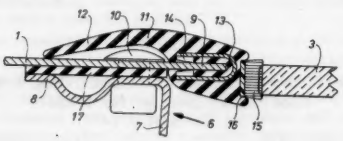
Johann Rengstl, Munich, and Alfons Lutz, Emmering, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 72,473

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 7825982[U]

Int. Cl.³ B60J *7/00*

U.S. Cl. 296—216 **7 Claims**



1. Vehicle body panel assembly comprising a vehicle body panel having a cutout for receiving a movable cover, a frame fastened to an underside of the vehicle body panel by fasteners and surrounding the cutout at a position located outwardly from an edge of said body panel defining the cutout, said frame being of an angular cross-section with an edge of the frame adjoining the body panel, and a rubber gasket, said gasket surrounding the edge of the body panel so as to cover the fasteners on an outer side of the vehicle body panel, and being constructed for providing a leak-proof sealing of the cutout by engaging a cover when the latter is in a position closing said cutout.

4,323,278

SEAT FOR VEHICLES, IN PARTICULAR TWO-DOOR PASSENGER AUTOMOBILES

Wolfgang Sukopp, Wolfsburg; Holger Schmidt, Brechtorf, and Wilfried Schwanz, Ahnsen, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,571

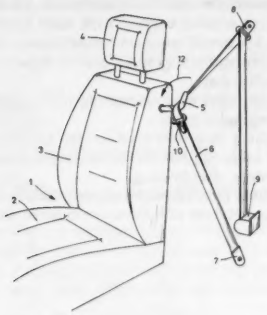
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908558

Int. Cl.³ A62B *35/00*

U.S. Cl. 297—481 **3 Claims**

1. A seat for vehicles, such as two-door passenger automobiles, with a backrest which is tiltable relative to a seat surface, an actuating element for releasing a backrest locking mechanism, which actuating element is arranged at the side of the backrest facing the vehicle door, and an associated three-point safety belt which is provided with a winding device, said safety belt having a portion associated with the shoulder of the vehicle occupant and running over a guide fitting arranged behind the backrest on the vehicle frame adjacent the door, character-

ized in that the actuating element is also designed as a guide element for guiding the safety belt on retraction into a reposi-



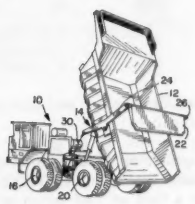
tory position where a part of it is along side the backrest and can be easily grasped by the vehicle occupant.

4,323,279

AUTOMATIC TAILGATE FOR A DUMP TRUCK

E. A. Domes, Carpentersville; Forrest C. Taylor, Northlake; Dusan M. Vacval, Buffalo Grove, and Lawrence A. Venere, Wood Dale, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 5, 1980, Ser. No. 146,976
Int. Cl.[3] B60P *1/26*
U.S. Cl. 298—23 DF **4 Claims**



1. In an off highway dump truck having a frame supported on a front and a rear axle, a dump body pivotally supported on said frame, said body having left and right sidewalls, a floor and an open end, said body capable of being pivoted from a transport mode to a dumping mode, an automatic tailgate comprising:

a pair of anchor cable outriggers attached to said frame, one of said pair of anchor cable outriggers located on the left side of said dump truck and a second of said pair of anchor cable outriggers located on the right side of said dump truck;

a pair of anchor cables, one of each of said pair attached to one of each of said anchor cable outriggers;

a left side support arm having a cable attachment point at one end thereof, a second end, and an attachment fitting between said first and second ends to which one of said anchor cables is attached;

a first pivot pin intergral with a plate attached to the exterior of said left sidewall of said dump body, said left side support arm pivotally supported through said attachment fitting to said first pivot pin;

a right side support arm having a cable attachment point at one end thereof, a second end and an attachment fitting between said first and second ends to which a second of said pair of anchor cables is attached;

a second pivot pin integral with a plate attached to the exterior of said right sidewall of said dump body, said right side support arm pivotally supported through said attachment fitting to said second pivot pin;

a tailgate carried by said left and right side support arms at said second ends thereof, said tailgate having a transverse beam affixed at each end thereof to said left and right support arms respectively, a plate fastened to said transverse beam and having a bottom edge and side edges, said side edges significantly inboard of said ends of said transverse beam, whereby said tailgate projects into said body inboard of said sidewalls.

3. An anchor cable outrigger attached to the frame of a dump truck for providing an attachment point for attaching an anchor cable for use in operating a tailgate, said anchor cable outrigger comprising:

an upper wishbone link having an attachment point at an outboard end thereof and horizontal holes through the inboard ends of said wishbone link;

a pair of lower links having outboard ends attached to the outboard end of said upper wishbone link and holes through inboard ends of each lower link;

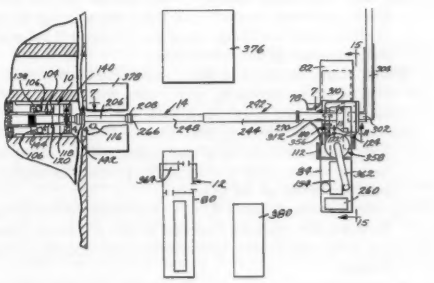
a plurality of pinned connectors fastened to said frame for accommodating inboard ends of each link of said anchor cable outrigger, each pinned connector having a removable pin passing through said connector and through respective holes of said links for attaching said anchor cable outrigger to said frame in a removable manner.

4,323,280

REMOTE CONTROLLED HIGH WALL COAL MINING SYSTEM

John B. Lansberry, Woodland; Jerome Apt, Jr., Pittsburgh, and Joseph D. Dury, Jr., Sewickley, all of Pa., assignors to Coalex, Inc., Woodland, Pa.

Continuation of Ser. No. 746,190, Nov. 30, 1976, abandoned.
This application Mar. 27, 1979, Ser. No. 24,371
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—1 **23 Claims**



1. A remote controlled coal mining system comprising:

a continuous mining machine having power driven means thereon for moving said machine through successive coal cutting cycles which include an advancing movement along a mined entry in a direction toward the working face,

cable means extending from said continuous mining machine to a remote control station,

light means carried by said continuous mining machine for illuminating portions of the space surrounding said continuous mining machine including the mine seam face disposed forwardly thereof and adjacent portion of the mined entry rearwardly thereof,

television camera means carried by said continuous mining machine for establishing electromagnetic signals indicative of the appearance of the illuminated space within the coal mine seam,

means for transmitting the electromagnetic signals estab-

lished by said television camera means to said control station,

television receiver means at said control station operatively connected with said transmitting means for converting said signals to a continuous picture of the appearance of at least a selected portion of the illuminated coal mine space,

means for moving a laser beam from a position adjacent said control station along at least two angularly related lines disposed within a common vertical plane perpendicular to the working face of the coal seam,

first laser beam detector means carried by said continuous mining machine adjacent the rearward portion thereof,

second laser beam detecting means carried by said continuous mining machine adjacent the forward portion thereof,

said first and second detectors each including a central laser sensing area aligned respectively in the direction of said vertical plane but displaced vertically with respect to one another, so that said moving laser beam will strike the same along said lines so long as the advancing movement of said continuous mining machine is aligned with said vertical plane,

said first and second detectors each including left and right-hand laser sensitive areas disposed horizontally to opposite sides of the associated central area,

means for transmitting from said detectors to said control station signals indicative of the laser sensitive areas in the lines of said moving laser beam, and

means at said control station connected with said cable means for enabling an operator at said control station to control the coal cutting cycle of said continuous mining machine based on the pictures provided by said television receiver means and the signals indicative of the laser sensitive areas in the lines of said moving laser beam whereby the coal cut during a cycle is cut between the mine roof and floor and the advancing movement is maintained in the direction of said vertical plane.

22. A continuous mining machine including

a track frame,

left and right-hand independently power driven endless track assemblies on said track frame for moving the same in either direction along a mine entry floor and for guiding the same during such movement,

a sump frame mounted on said track frame for power driven horizontal reciprocating movement with respect to said track frame and track assemblies,

coal cutting and gathering means carried by said sump frame for cutting the coal in a coal seam and for gatheringly moving the cut coal to a discharge position located at the central portion of the machine,

an inlet vacuum air duct fixed to said sump frame having a forward inlet opening disposed at said discharge position and a rear end portion of constant cross-sectional configuration,

a cooperating duct section fixedly carried by said track frame having a forward end position of constant cross-sectional configuration disposed in telescopic relation with respect to the rear end portion of said inlet duct,

and means for sealingly connecting said telescopically arranged portions while permitting telescopic movement to take place in response to the power driven movement of said sump frame.

4,323,281

METHOD OF SURFACE MINING

Edward H. Greenwald, Sr., McMurray; Edward H. Greenwald, Jr., and Frederick R. Bonci, both of Pittsburgh, all of Pa., assignors to Eavenson, Auchmuty & Greenwald, Coraopolis, Pa.

Filed Feb. 19, 1980, Ser. No. 122,394

Int. Cl.[3] E21C *41/00*

U.S. Cl. 299—1 **11 Claims**

1. A method of developing, mining and restoring mining property having at least one mineral bearing rock seam which comprises:

(a) collecting three-dimensional topographic control data and physical site conditions, such as water flow data;

(b) collecting mineral bearing rock seam location data and overburden stratification and constituency data;

(c) displaying said topographic control data in the form of a topographic map;

(d) displaying said mineral bearing rock seam data on the said topographic map;

(e) establishing an access road to said mineral bearing rock seam by using the data displayed on said topographic map by said steps of collecting;

(f) establishing environmental control facilities, topsoil storage areas and head of hollow overburden disposal sites by

using the data displayed on said topographic map by said steps of collecting;

(g) producing a series of topographic map means using said topographic map to depict mining operations by sequential phases such that an initial mining operation is depicted on a first of said series of topographic map means development, succeeding mining and restoring operations are each depicted on others of said topographic map means;

(h) removing mineral bearing rock from said mineral bearing rock seam to complete the first of said sequential phases of the actual mining operation;

(i) completing a succeeding sequential phase of removing mineral bearing rock from said mineral bearing rock seam; and

(j) restoring the disturbed portions of the mining property.

4,323,282

CONVEYING TROUGH WITH MINING MACHINE CUTTER GUIDE SURFACES

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,330

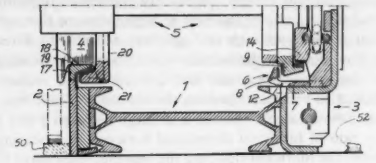
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 2927962

Int. Cl.[3] E21C *35/08*

U.S. Cl. 299—43 **9 Claims**

1. A conveying trough for use in a coal mining seam, having a coal mining sidewall and a waste sidewall, opposite to, and spaced from, the winning sidewall, comprising, a guideplate adapted to be secured to the waste sidewall, a base frame adapted to be located adjacent the winning sidewall at a spaced location from the guideplate, a gantry-like cutter having one side with a track wheel having a running surface associated

with said guideplate and spanning across the space between said guideplate and said base frame, an angle bar having a first substantially horizontal fixing leg portion secured to said base frame and having an upright guide leg portion affixed to said



horizontal portion, a tracking bar carried by said cutter and having an edge in cooperative engagement with said guide leg portion, said tracking bar and said guide leg portion having substantially vertical interengageable slide surfaces.

4,323,283

TRACK ADJUSTING AND RECOIL APPARATUS FOR USE WITH CRAWLER VEHICLES

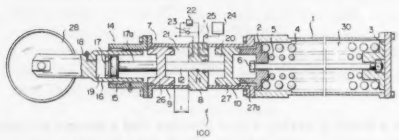
Ei-ichi Muramoto, Hirakata, and Motomu Matsui, Ibaragi, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 22, 1980, Ser. No. 181,390

Claims priority, application Japan, Aug. 29, 1979, 54/117789[U]

Int. Cl.³ B62D *55/30*

U.S. Cl. 305—10 **5 Claims**



1. A track adjusting and recoil apparatus comprising:

(a) a cylinder having wall means defining first and second chambers;

(b) a first piston reciprocably accommodated within said first chamber and defining a first sealed chamber between said first piston and said wall means;

(c) a second piston reciprocably accommodated within said second chamber for movement by a track idler means and defining a second sealed chamber between said second piston and said wall means;

(d) a rod disposed through said wall means between said first and second pistons in a manner such that said rod always comes into contact with both the pistons;

(e) means for biassing said first piston inwardly;

(f) a cylindrical cover fitted to the distal end of said cylinder so as to restrict the reciprocal movement of the second piston;

(g) a track tension adjusting means for maintaining a predetermined track tension by adjustment of an idler wheel connected to the distal end thereof, said track tension adjusting means including a cylindrical member reciprocably inserted into said cylindrical cover and a piston defining an adjusting pressure chamber between said cylindrical member and said piston, said piston being provided on the opposite side of said pressure chamber with an integral piston rod abutting against said second piston on the opposite side of said rod; and

(h) passage means for allowing the fluid communication between said first and second sealed chambers through a relief valve and a check valve provided in said passage means with parallel relation to said relief valve.

4,323,284

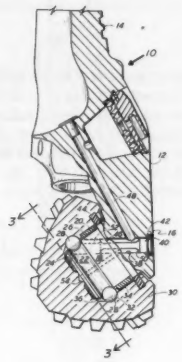
THRUST FACE BEARING STRUCTURE FOR ROLLING CUTTER DRILL BIT

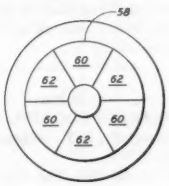
John S. Childers, and Terry H. Mayo, both of Houston, Tex., assignors to Reed Rock Bit Company, Houston, Tex.

Filed Oct. 17, 1980, Ser. No. 197,835

Int. Cl.³ F16C *17/12*

U.S. Cl. 308—8.2 **6 Claims**





1. In a rolling cutter drill bit of the type having at least one downwardly extending leg with a downwardly extending cantilevered bearing shaft thereon, and a rolling cutter rotatably mounted on said bearing shaft by radial bearing means and axial bearing means; the improvement comprising:

said axial bearing means comprising a relatively flat multi-segmented thrust bearing surface;

said multi-segmented surface having at least two segments of differing metallic compositions, one of said segments being a metal composition having low coefficient of friction at low temperatures and the other of said segment metal compositions having low coefficient of friction at high temperatures.

4,323,285

DUAL THRUST BEARING FOR A SHAFT

Dale P. Gilson, Bellflower, Calif., assignor to Kobe, Inc., Commerce, Calif.

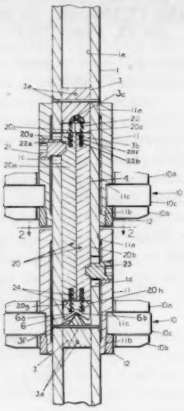
Filed Mar. 14, 1980, Ser. No. 130,280

Int. Cl.³ F16C *17/06*

U.S. Cl. 308—160 **10 Claims**

1. A dual thrust bearing support for a shaft comprising: a pair of axially adjacent thrust bearings, each bearing having a stationary annular thrust absorbing element adapted to be secured to a housing and an annular thrust receiving rotary element; a shaft rotatable in said annular thrust receiving rotary elements but axially shiftable relative thereto, said shaft having a hollow central portion; a first thrust transmitting member mounted in said hollow central shaft portion for relative axial movements; means for rigidly securing said first thrust transmitting member to one of said rotary thrust transmitting elements to transmit

thrust force to the associated thrust absorbing element; a second thrust transmitting member mounted in said hollow central shaft portion for relative axial movements; means for rigidly securing said second thrust transmitting member to said



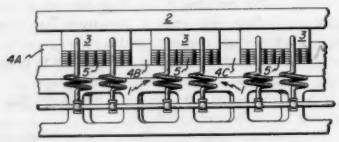
other rotary thrust transmitting element to transmit thrust force to the associated thrust absorbing element; and means inter-connecting said shaft and each of said thrust transmitting members to transmit thrust force on said shaft equally to said thrust transmitting members.

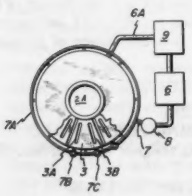
4,323,286

THRUST BEARING COOLING APPARATUS

John H. Vohr, Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,904
Int. Cl.³ F16C *17/06*
U.S. Cl. 308—160 **8 Claims**





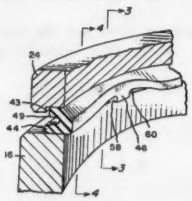
1. A bearing cooling apparatus for a high pressure, lubricant-flooded thrust bearing, which bearing comprises an annular runner with a substantially flat bearing surface, a plurality of bearing pads each including a substantially flat bearing surface, a retainer for holding all of said pads is a generally circular array with their bearing surfaces facing, respectively, arcuately-spaced portions of the bearing surface of said runner in sliding relationship therewith, and a plurality of resilient means disposed, respectively, between each of said pads and the retainer to resiliently bias the pads toward the runner; said cooling apparatus comprising a source of coolant, a plurality of wall means each define at least one elongated groove in the bearing surface of each of said pads, conduit means for conducting coolant from said source to each of said grooves, and high pressure pumping means operatively connected to pump a predetermined volume of coolant at high pressure through said conduit means and into said grooves thereby to force coolant to flow between the annular runner and each bearing surface of the respective pads, said predetermined volume being sufficient to produce between the runner and pad bearing surfaces a flow rate of coolant in a range between $\frac{1}{3}$ and $\frac{1}{4}$ of the flow rate of lubricant developed between said bearing surfaces, from the lubricant flooding the bearing, responsive to sliding movement of the runner relative to said pads.

4,323,287

BEARING SEAL

Leo Stella, Bristol, and America E. Marola, Torrington, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Oct. 3, 1979, Ser. No. 81,524
Int. Cl.³ F16C *33/78*
U.S. Cl. 308—187.1 **2 Claims**



1. In a bearing having a first member and a second member with an annular space between said first member and said second member: an annular seal extending across said annular space, said annular seal having an annular lip portion normally in contact with one of said members around the entire circumference of the seal to keep lubricant in the annular space between said first member and said second member behind said annular seal, the annular seal having radial protrusions located behind the lip portion in contact with said one member and at circumferentially spaced locations on the annular seal, said protrusions being in contact with the same member as the lip and adapted to keep the back portion of the annular seal adjacent each side of the protrusion spaced from the member the lip contacts.

4,323,288

BEARING UNIT WITH IMPROVED INNER RACE

Harvey E. Smith, Sr., Grand Rapids, and Siegfried K. Weis, Byron Center, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Feb. 25, 1980, Ser. No. 124,556
Int. Cl.³ F16C *33/60*
U.S. Cl. 308—196 **16 Claims**

1. A bearing assembly which is especially useful as a conveyor trolley wheel comprising:

a plurality of anti-friction ball members;

outer race means including an outer raceway for supporting said ball members;

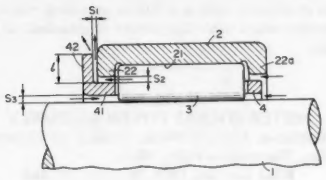
inner race means including an inner raceway having a minimum diameter and spaced radially inwardly of said outer race means for supporting said ball members opposite to said outer race means;

said assembly including a radial plane extending through the

centers of said ball members and said minimum diameter of said inner race means;

said inner race means including an annular, first inner race part having a central aperture therethrough, a raceway shoulder on one side of said radial plane, a curved raceway portion extending from said shoulder to at least said minimum diameter at said radial plane, and an extension beyond said radial plane on the other side thereof;

said inner race means also including an annular, second inner race part stamped from sheet metal, engaged with said first inner race part on said other side of said radial plane, and having a curved shoulder forming another curved



portion of said inner raceway and extending beyond said extension of said first inner race part on said other side of said radial plane to guide and retain said ball members in said inner and outer raceways; and

flange means formed in one piece with said second inner race part for retaining said second inner race part to said first inner race part and recess means formed in said central aperture of said first inner race part generally opposite said minimum diameter of said curved raceway portion for receiving said flange means, said flange means being received in said recess means for retention of said inner race parts together.

4,323,289

ROLLER BEARING HAVING A FORCIBLE LUBRICATION FUNCTION

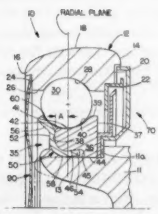
Toshio Suzuki, Chigasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1980, Ser. No. 143,006

Claims priority, application Japan, Nov. 15, 1979, 54-141436[U]

Int. Cl.³ F16C *19/49*

U.S. Cl. 308—202 **2 Claims**



1. A bearing assembly for a rotating element, including an outer race having a rib extending radially inwards from an end portion thereof, a plurality of rollers held within said race for rotational movement about the rotating element, a cage engaging said rollers for movement therewith, and means for forcibly circulating lubricant through the bearing assembly, said means including a first clearance formed between the outer surface of said cage and the inner surface of said race, a second clearance formed between the inner surface of said cage and the outer surface of the rotating element, and a ring portion carried by said cage and extending axially outward from said rib with a third clearance therebetween, said clearances being sufficient to cause lubricant to be extracted from the bearing assembly through said first and third clearances by the centrifugal forces applied to the lubricant by the rotation of said rotating element and to be drawn into the bearing assembly through said second clearance.

4,323,290

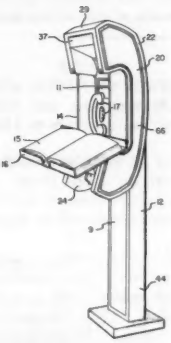
TELEPHONE ENCLOSURE ASSEMBLY AND DIRECTORY HOLDER APPARATUS

John S. Hickman; John B. Olson, both of Milwaukee, and Richard L. Jeanson, Watertown, all of Wis., assignors to Utility Products, a division of Reliable Electric Co., Milwaukee, Wis.

Filed Dec. 31, 1979, Ser. No. 108,822

Int. Cl.³ A47B *63/00*; B42D *17/00*; E04H *1/14*

U.S. Cl. 312—100 **4 Claims**



1. A housing enclosure and directory holderassembly for use with a telephone unit, said assembly comprising:

a one-piece housing shell which at least partially encloses a telephone unit:

a directory holder assembly connected to said housing shell and including means for pivoting and swiveling said holder from a closed position to an open position;

said housing shell includes a pair of spaced side walls, a top wall and a back wall, said back wall having an opening with the edges of the opening being complimentary to the edges of a telephone unit adapted to be inserted in said opening, and an inclined wall surface located below said shell opening adapted to receive said telephone unit; and

wedge means for securing said shell to a wall or pedestal mounting means, said wedge means including a tapered wall adapted to seat on said inclined shell wall and securing means for securing said wedge means to said telephone mounting means and wedging said wedge means below the telephone unit to lock said shell to each said wall or pedestal mounting means.

4,323,291

DESK OR THE LIKE WITH WIRE MANAGEMENT

Douglas C. Ball, Quebec, Canada, assignor to Hauserman Ltd., Waterloo, Canada

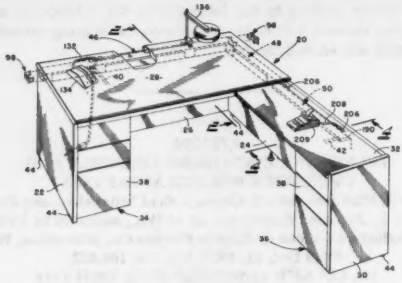
Filed Jun. 8, 1979, Ser. No. 46,779

Int. Cl.³ A47B *17/00, 13/02*

U.S. Cl. 312—194 **33 Claims**

1. A desk or like unit comprising a vertical support panel, a horizontal top panel mounted on and forming a corner with said vertical support panel, and enclosure means secured to

said vertical and top panels at said corner for defining with such corner an elongate wiring duct extending parallel to said



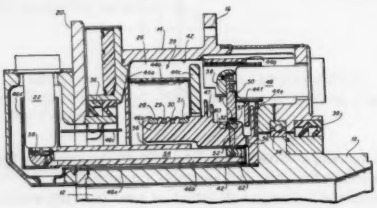
vertical and top panels, said enclosure means and panels cooperating to form the walls of said wiring duct.

4,323,292

HIGH VOLTAGE SLIP RING ASSEMBLY

Norris E. Lewis, Christiansburg, and Herbert C. Walker, Blacksburg, both of Va., assignors to Litton Systems, Inc., Blacksburg, Va.

Filed May 12, 1980, Ser. No. 148,707
Int. Cl.[3] H01R *39/00*
U.S. Cl. 339—5 M 10 Claims



1. A high voltage slip ring assembly adapted to be filled with an insulating fluid comprising:

a rotor and a stator for defining a cavity therebetween,

seal means for operatively sealing said cavity for retaining the insulating fluid therein,

said rotor and said stator being at ground potential,

anode coupling means within said cavity,

cathode coupling means within said cavity,

said anode and cathode coupling means each including Faraday shielding means, and

dielectric barrier means within said cavity for blocking line of sight particulate paths, when the slip ring assembly is transferring power, between said anode means and said cathode means, between said anode means and said rotor and stator, and between said cathode means and said rotor and stator,

whereby operational short circuiting and arcing within said cavity is prevented.

4,323,293

TERMINAL LEAD WITH LABYRINTHINE CLIP

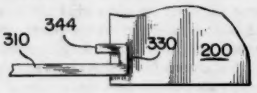
Joseph R. DeRouen, Banning, and Ronald E. Smith, Sunnymead, both of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Jun. 30, 1980, Ser. No. 164,760
Int. Cl.[3] H01L *23/48*
U.S. Cl. 339—17 CR 5 Claims

1. In an electronic device, of the type having a component deposited onto a substrate, metallized contact areas on said substrate to provide an electrical path for said component, and a molded housing encasing said substrate, an improved terminal lead for attachment to said substrate, comprising:

an elongate metal strip having first and second ends; and

clip means formed in said strip proximate one of said ends,



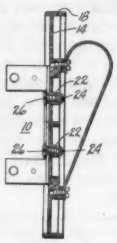
said clip means comprising first and second contiguous orthogonal loops, whereby said first and second loops are each in contact with a different opposing surface of said substrate when said clip means is attached to said substrate.

4,323,294

METER SOCKET COVER ASSEMBLY

Darrell Robinson, Milford, Mich., assignor to Ekstrom Industries, Inc., Farmington Hills, Mich.

Filed Dec. 14, 1979, Ser. No. 103,464
Int. Cl.[3] H01R *31/08*
U.S. Cl. 339—19 2 Claims



1. A cover for a meter socket adapted to receive jumpers for completing a circuit between meter socket terminals, said cover comprising a disc formed of insulating material, said disc having a peripheral flange having a diameter and thickness substantially the same as that of a retaining flange of a meter intended for assembly into said meter socket, a central portion substantially thinner than the width of said flange, and a series of cylindrical walls extending from said central portion, said walls being closed at the forward end on the forward side of the disc and open at the other end on the rear side of the disc forming a pocket, said walls being dimensioned to receive a fastening device from the rear side for attachment of a jumper without exposure of the fastening device on the forward side of the disc.

4,323,295

TWO-PIECE STRAIN RELIEF AND CONNECTORIZED FLAT CABLE ASSEMBLY FORMED THEREWITH

Dwight M. Davis, Jr., Pickerington, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.

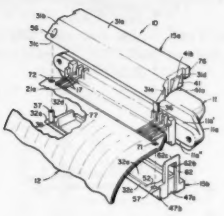
Filed May 29, 1980, Ser. No. 154,549
Int. Cl.[3] H01R *13/58*
U.S. Cl. 339—107 22 Claims

1. A strain relief member for a connectorized flat cable, comprising:

two complementary molded plastic sections, each section including:

a. forward and rearward elongated planar wall portions, the latter being angularly oriented relative to the former, and extending in a direction toward the complementary wall portion of the other section when they are assembled;

b. a pin-receiving bore formed in one side of said member section near one end thereof;
c. an integral pin extending outwardly from said one side, and near the other end, of said member section, and being oriented for insertion into said bore in the other complementary section;
d. an integral locking detent extending outwardly from said one side of said member section, and located at the other end thereof;
e. a boss extending perpendicularly outward from said one side of said forward wall portion, said boss being adapted to be received within an accommodating recess of an associated connector when said member sections are subsequently assembled in interlocked relationship therewith, and



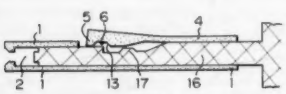
f. a locking latch extending outwardly from said one end and side of said member section, said latch in each section being adapted to snap into locking engagement with the detent of the other section when said complementary sections are brought into close mutually disposed relationship, with only the thickness of a terminating section of an associated cable interposed therebetween, such that the pin of each section is inserted within said bore of the other member section, while the boss of each section is nested within a receiving recess of an associated connector, said pins being further adapted, when said member sections are interlocked, to also extend through respectively aligned pre-formed apertures formed along opposite border regions of an interposed terminating section of cable so as to reliably anchor the latter to an associated connector.

4,323,296

CONNECTOR

Ikuhiro Andoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 4, 1980, Ser. No. 118,216
Claims priority, application Japan, Feb. 7, 1979, 54-14714[U]
Int. Cl.³ H01R *13/506, 13/516*
U.S. Cl. 339—217 S **10 Claims**



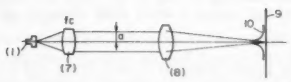
1. A connector comprising:
a molded connector housing including insertion holes which can be formed by using a molding core and which receive female connector elements which may be inserted therein; and
flexible abutment members which are located in the corresponding insertion holes and which are molded integrally with the connector housing, said flexible abutment members being provided with separate free ends which provide large contact areas between the flexible abutment members and the corresponding female contact elements which are to inserted in the insertion holes, said free ends being oriented so as to tend to prevent the female contact elements from coming out of the corresponding insertion holes, each of said flexible abutment members also being provided with a recessed groove having an inclined surface at one end thereof which enables all of the members to be flexed while permitting the molding core to be withdrawn from the connector housing to form the insertion holes after the completion of the connector housing molding operation.

4,323,297

IMAGE FORMING OPTICAL SYSTEM USING A SEMICONDUCTOR LASER

Naoto Kawamura, Inagi; Koichi Masegi; Isao Hakamada, both of Yokohama; Haruo Uchiyama, Kawasaki; Takashi Kitamura, Yokohama, and Masaaki Ishii, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 133,316
Claims priority, application Japan, Mar. 30, 1979, 54-39075
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.8 **6 Claims**



1. An image forming optical system using a semiconductor laser, comprising:
a semiconductor laser having different diverging points and divergence angles of the beam thereof in orthogonal directions;
a scanned surface on which the beam from said semiconductor laser is condensed; and
a spherical surface optical system disposed between said semiconductor laser and said scanned surface for condensing the beam from said semiconductor laser on said scanned surface, said spherical surface optical system being formed by a first spherical surface image forming optical system and a second spherical surface image forming optical system as viewed from said semiconductor laser side, the focal length f_c of said first spherical surface image forming optical system being

$$f_c^2 = \frac{\gamma}{\sqrt{\alpha_x \cdot \alpha_y}} \left(1 + \frac{S_x^2}{2\left(1 + \sqrt{\frac{\alpha_x}{\alpha_y}}\right)} \right)$$

$$0.7 < \gamma < 1.4$$

$$S_x = \frac{\pi}{\lambda} \sin^2 \theta_{ox} \cdot A_s$$

$$\alpha_x = 0.97 \cdot \frac{\sin^2 \theta_{ox}}{a^2}$$

$$\alpha_y = 0.97 \cdot \frac{\sin^2 \theta_{oy}}{a^2}$$

where γ is a constant, λ is the wavelength of said semiconductor laser, A_s is the interval between the diverging origins of the semiconductor laser, θ_{ox} is the angie of expanse of the location whereat the energy of the beam is i/e^2 in the x-direction expanse of the beam from said semiconductor laser, θoy is the angle of expanse of the location whereat the energy of the beam is $1/e^2$ in the y-direction expanse of the beam from said semiconductor laser and a is an exit pupil radius of said first spherical surface optical system.

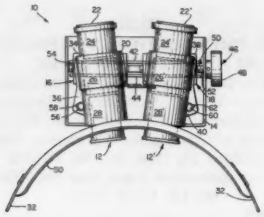
4,323,298
WIDE FIELD OF VIEW GOGGLE SYSTEM

Thomas M. Brennan, Cambridge, Mass., assignor to Baird Corporation, Bedford, Mass.

Continuation of Ser. No. 967,273, Dec. 7, 1978, abandoned. This application Jun. 6, 1980, Ser. No. 157,018

Int. Cl.³ G02B *23/12, 23/18*

U.S. Cl. 350—36 **2 Claims**



1. An optical viewing device in the form of a night vision goggle system and having a wide field of view, said system comprising:

(a) a frame;

(b) adjusting means mounted to said frame and including a first channel support and a second channel support, said first channel support having a first base and a first body, said second channel support having a second base and a second body, said first base and said second base constrained to said frame for relative lateral movement, said first body mounted to said first base for pivoting movement relative thereto, said second body mounted to said second base for pivoting movement relative thereto, first means for controlling said relative lateral movement of said first base and said second base to effect interpupillary adjustment over an interpupillary distance of from about fifty-five mm. to about seventy-two mm., and second means for controlling said pivoting movement of said first body and said second body, said second means being fixed once said pivoting movement of said first and second body relative to one another has been effected;

(c) a first optical channel with a narrow field of view and having a first optical axis, said first optical channel mounted to said first channel support of said adjusting means;

(d) a second optical channel with a narrow field of view and having a second optical axis, said second optical channel mounted to said second channel support of said adjusting means, the angular magnitude of said field of view of said first optical channel being the same as the angular magnitude of said field of view of said second optical channel;

(e) said first optical axis and said second optical optical axis constrained for relative angular movement with respect to one another in a common plane to provide an increased wide field of view characterized by having a common overlap and an angular resolution equal to that provided by said field of view of said first and second optical channels, said first optical axis and said second optical axis intersecting one another at an angle of about twenty degrees.

4,323,299
WIDE FIELD SPECULAR SCANNING DEVICE

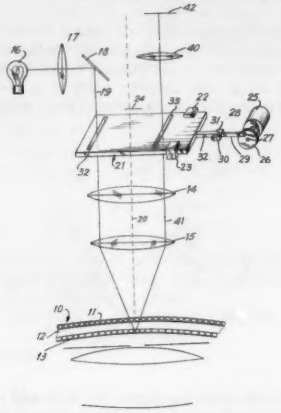
Calvin W. Roberts, 160 E. 88th St., New York, N.Y. 10028

Filed Jul. 3, 1980, Ser. No. 165,568

Int. Cl.³ G02B *21/06;* A61B *3/12*

U.S. Cl. 350—91 **9 Claims**

1. A specular microscope having wide field scanning for the examination under magnification of a selected generally planar area within the cornea of an eye, said microscope comprising a lens system including a converging lens and an objective lens, observation means, opaque masking means positioned in a plane normal to the optical axis of said microscope between said lens system and said observation means, said masking means including first and second spaced parallel linear slit portions extending therethrough and disposed at opposite sides of said optical axis, means for oscillating said masking means in said plane in a direction normal to the length of said slit portions at a desired rate, illuminating means for directing a beam



of light through said first slit portion, said converging lens and said objective lens, to illuminate a narrow elongate area within the cornea of an eye positioned behind said objective lens on one side of said masking means, said observations means being positioned on the other side of said masking means to receive light reflected from said elongate area and passing through said objective and converging lenses and said second slit portion in the direction of said optical axis of said microscope.

4,323,300
OPTICAL FIBRE CONNECTORS

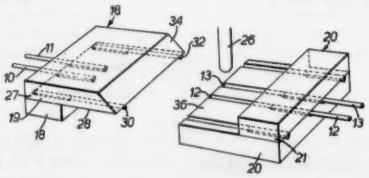
William J. Stewart, Fritwell; John A. Robinson, and Richard Carpenter, both of Northampton, England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Dec. 21, 1979, Ser. No. 106,040

Claims priority, application United Kingdom, Dec. 16, 1978, 48828/78

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.21 **5 Claims**



1. An optical fibre connector comprising a first member and a second member, each of said first and second members having a flat plane surface formed thereon and each said flat plane surface having a groove formed therein, first and second optical fibres, said first optical fibre being located in and extending along the full length of said groove formed in said flat plane surface of said first member, and said second optical fibre being located in and extending along the full length of said groove formed in said flat plane surface of said second member, a third member, said third member having a flat plane surface of

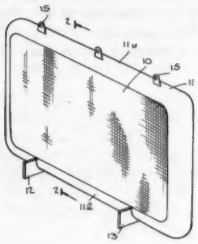
greater area than that of said first member, said third member being mounted to clamp said first optical fibre in said groove, said first and second members abutting together with their flat plane surfaces lying in the same plane and said first and second optical fibres being in axial alignment with their ends abutting, and said flat plane surface of said third member overlapping said flat plane surface of said second member, a cam surface formed on said third member, said cam surface reacting with a fixed member to urge said third member towards said flat plane surface of said second member to clamp said second optical fibre in said groove, and resilient means for urging said first and second members together in an axial direction.

4,323,301

COLLAPSIBLE REAR/FRONT PROJECTION SCREEN ASSEMBLY

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed May 14, 1980, Ser. No. 149,740
Int. Cl.³ G03B *21/56*
U.S. Cl. 350—117 **6 Claims**



1. A collapsible and portable screen assembly capable of acting, when erected as a rear or front projection screen in conjunction with an optical projector, said assembly comprising:

A. a frame consituted by an inflatable tubular loop formed of flexible plastic material having a rectangular formation and provided with valve means to effect inflation or deflation thereof; and

B. a screen sheet formed of thin flexible translucent plastic material whose margins are secured to said frame, said sheet having fine particles of titanium oxide dispersed therein to impart whiteness thereto and to function as a diffusion agent, said sheet being thermally embossed to define thereon myriad white reflective facets which cause light scattering in all directions, thereby causing the sheet to be both reflective and transmissive and to have light scattering characteristics, whereby when the loop is inflated the sheet assumes a planar form and functions either as a front or rear projection screen, and deflated loop and screen being foldable into a compact package.

4,323,302

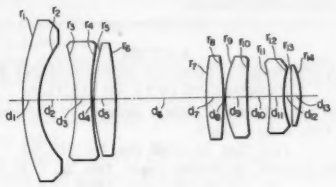
WIDE-ANGLE ZOOM LENS SYSTEM

Tadashi Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1980, Ser. No. 125,050
Claims priority, application Japan, Mar. 2, 1979, 54/24901
Int. Cl.³ G02B *15/14*
U.S. Cl. 350—426 **10 Claims**

1. A wide-angle zoom lens system comprising a front lens group comprising a first negative meniscus lens component having a convex surface on the object side, a second negative lens component and a third positive lens component, and a rear lens group comprising a fourth positive lens component, a fifth positive meniscus lens component having a convex surface on the object side, a sixth negative lens component and a seventh positive lens component; said lens system being so adapted as to permit changing focal length of the entire lens system as a whole by varying the airspace reserved between said front and rear lens groups and satisfy the conditions enumerated below:

(1) $1.68 < n_1, n_2$



(2) $n_4, n_5 < 1.65$

(3) $1.75 < n_6$

$$0.43 < \frac{d_1 + d_2 + d_3}{f} < 0.82 \quad (4)$$

(5) $1.6 < |r_6|/f$

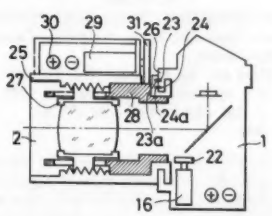
wherein the reference symbols n_1, n_2, n_4, n_5 and n_6 represent refractive indices of the first, second, fourth, fifth and sixth lens components respectively, the reference symbols d_1 and d_3 designate thicknesses of the first and second lens components respectively, the reference symbol d_2 denotes the airspace reserved between the first and second lens components, the reference symbol r_6 represents radius of curvature on the image side surface of the third lens component and the reference symbol f designates focal length of the entire lens system as a whole at the wide position.

4,323,303

AUTOMATIC FOCUSING CAMERA

Shigeo Enomoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1980, Ser. No. 115,327
Claims priority, application Japan, Feb. 28, 1979, 54-23024
Int. Cl.³ G03B *3/10*
U.S. Cl. 354—25 **5 Claims**



1. In an automatic focusing still camera in which a focus control member of a first type of interchangeable lens is driven by a first focusing electric motor provided on a camera body of said still camera, the improvements comprising:

a circuit for controlling rotation of said motor to move a lens of said first type along an optical axis thereof to a focus point;

said camera body having first signal contacts provided on a lens mounting mechanism thereof, said signal contacts being coupled to receive an output signal of said circuit; and

a second type of interchangeable lens comprising a focus control member, a second focusing electric motor, and second signal contacts the rotation and stopping of said second focusing motor being controlled in accordance with said signal received through said second signal

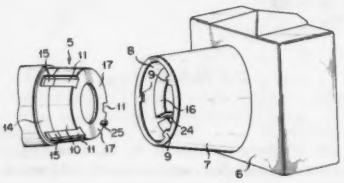
contacts from said first signal contacts, and means for supplying current to said second focusing electric motor, wherein said focus control member of said second type of interchangeable lens is driven by said second electric motor for focalization.

4,323,304

DEVICE FOR FITTING AN ATTACHMENT TO AN ENDOSCOPE OCULAR SECTION

Fumiaki Ishii, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,755
Claims priority, application Japan, Dec. 24, 1979, 54-167775
Int. Cl.[3] G03B *29/00*; A61B *1/06*
U.S. Cl. 354—62 **7 Claims**



1. A device for fitting an ocular section attachment to an ocular section of an endoscope which comprises:

a cylindrical receptacle which has a first end face and is provided on an endoscope ocular section;

an adapter which is provided on an ocular section attachment to be fitted around the cylindrical receptacle by being rotated;

a coupling ring rotatably disposed in the adapter and having a second end face abuttable against the first end face of the receptacle; and

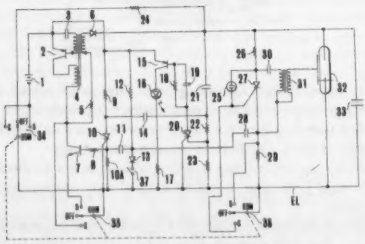
connection means for connecting the coupling ring and cylindrical receptacle together in a state preventing their relative movement.

4,323,305

DEVICE FOR INSERTING DATA INTO PHOTOGRAPHS

Toshihiko Satoh, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,691
Claims priority, application Japan, Jul. 30, 1979, 54-97765
Int. Cl.[3] G03B *17/24, 17/20*
U.S. Cl. 354—106 **3 Claims**



1. A data inserting device having a flash discharge tube employed as a light source required for data insertion, said data inserting device comprising:

a capacitor for supplying said flash discharge tube with an electric energy, said capacitor having a particular recycle time;

display means for displaying completion of data insertion; and

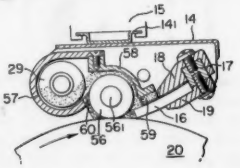
driving means for driving said display means for a predetermined period of time in response to a flashing action of said flash discharge tube, said predetermined period of time being longer than the recycle time of the capacitor.

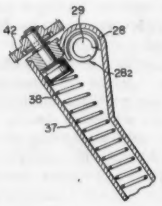
4,323,306

DEVELOPER CLEANING DEVICE FOR ELECTROPHOTOGRAPHY

Yoshio Ito; Katuhiko Yamada; Tadayuki Kitajima, all of Yokohama; Koichi Miyamoto, Tokyo; Hiroo Kobayashi, Tokyo, and Yoshikuni Mohvama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 934,688, Aug. 17, 1978, Pat. No. 4,218,131, which is a continuation of Ser. No. 648,821, Jan. 13, 1976, abandoned. This application Nov. 5, 1979, Ser. No. 91,483
Claims priority, application Japan, Jan. 17, 1975, 50/7528
Int. Cl.[3] G03G *21/00*
U.S. Cl. 355—15 **27 Claims**





1. A cleaning device for use with an electrophotographic machine having a movable image bearing member for bearing a developed image formed in accordance with an electrostatic image, the image bearing member being reusable after the developed image is used and the image bearing member is cleaned, said device comprising:

cleaning means for removing developer from a surface of the image bearing member, said means including a cleaning member which extends transversely with respect to the direction of movement of the image bearing member;

means for transporting the developer removed by said cleaning means away from the image bearing member along said transverse direction thereof;

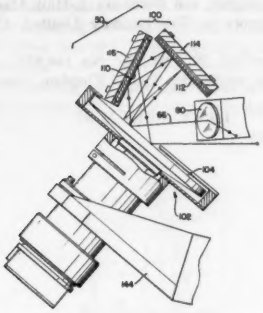
means defining a passage for leading the developer transported by said transporting means to means for collecting developer; and

means for preventing the deposition of the removed developer on said passage means, said preventing means including a helical member rotatable about an axis extending substantially along said passage means.

4,323,307
LIGHT BEAM SCANNING APPARATUS

Douglas A. Seeley, High Bridge, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Jun. 6, 1980, Ser. No. 157,147
Int. Cl.[3] G03B 27/48, 27/50, 27/70
U.S. Cl. 355—51 19 Claims

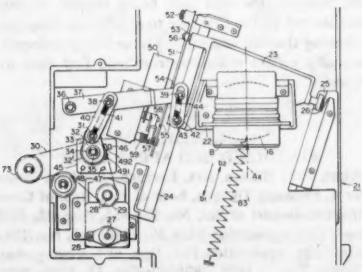


1. Beam scanner apparatus which comprises
(a) rotatable reflective means having an axis of rotation normal thereto; and
(b) at least one planar reflective segment positioned on said reflective means at a tilt angle which is off normal to said axis of rotation; and
(c) means for rotating said reflective means about the axis of rotation; and
(d) a roof mirror arrangement which comprises a first planar reflective surface and a second planar reflective surface, said first and second reflective surfaces are disposed in fixed positions relative to each other and said reflective means; and
(e) means for supporting said reflective means in the path of a light beam such that said beam is reflected 4n times by said reflective means and 2n times between said first and second reflective surfaces before said beam emerges from said optical scanner apparatus, wherein n is any integer.

4,323,308
COPY MAGNIFICATION MODIFYING APPARATUS

Tadayuki Kitajima, and Yoshikuni Tohyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 99,996, Dec. 4, 1979, abandoned. This application Dec. 31, 1980, Ser. No. 221,621
Claims priority, application Japan, Dec. 8, 1978, 53-151768; Dec. 8, 1978, 53-151769
Int. Cl.[3] G03B 27/34, 27/40, 27/70
U.S. Cl. 355—57 16 Claims

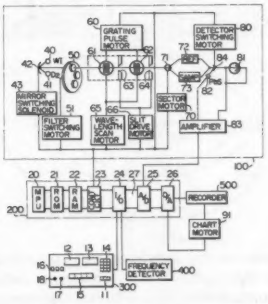


1. A copy magnification modifying apparatus for modifying the copy magnification by displacing an optical member involved in the image formation to and maintaining the same at a position adapted for forming an image of a selected magnification of an original onto a photosensitive member, comprising:
carriage means for supporting said optical member;
a rotary drive source;
an optical member displacing mechanism for transmitting the drive force of said rotary drive source through one-directional rotary clutch means and resilient means to said optical member thereby guiding the same along a determined path;
stopper means to engage with said carriage means thereby stopping said optical member at a position corresponding to the selected magnification; and
control means adapted for continuing the function of said rotary drive source after the stopping of said optical member to cause a deformation in said resilient means thereby pressing said carriage means against said stopper means and generating a resilient force biasing said one-directional rotary clutch means in a direction opposite to the rotating direction thereof, and thereafter terminating the function of said rotary drive source.

4,323,309
SPECTRO-PHOTOMETER WITH ARITHMETIC AND CONTROL UNIT

Nobuo Akitomo, and Shigeo Tohyama, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1980, Ser. No. 124,853
Claims priority, application Japan, Mar. 2, 1979, 54/24956
Int. Cl.[3] G01J 3/02, 3/42
U.S. Cl. 356—319 12 Claims



1. A spectro-photometer having an arithmetic and control unit comprising a spectro-photometer including a calibration mechanism and a wavelength-range changeover mechanism; operation setting means for presetting measuring conditions of said spectro-photometer; storage means for storing therein calibration signals in the order of calibration to be performed by said calibration mechanism, changeover signals in the order of changeover to be performed by said wavelength-range changeover mechanism, and the input information from said operation setting means; an arithmetic unit for generating control signals required to automatically control said calibration mechanism and said wavelength-range changeover mechanism on the basis of said calibration signals, said changeover signals and said input information, all of which are stored in said storage means, and for performing an arithmetic processing an measured values obtained by said spectro-photometer; and a control unit for controlling said calibration mechanism and said wavelength-range changeover mechanism in response to said control signals from said arithmetic unit, further comprising:
first display means for displaying an indication that said

spectro-photometer is subjected to calibration or changeover of the wavelength range, in accordance with a command from said arithmetic unit, when said input information read out of said storage means by said arithmetic unit shows that said spectro-photometer is being automatically subjected to said calibration or said changeover of wavelength range; and

second display means for displaying indications of the states of the steps in said calibration or wavelength-range changeover operations required to be carried out till the termination of operation in said calibration mechanism or said wavelength-range changeover mechanism, in accordance with an output from said arithmetic unit.

4,323,310

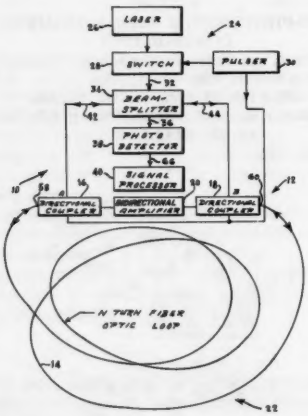
FIBER OPTIC ROTATION SENSING INTERFEROMETER

Herbert J. Shaw, and Marvin Chodorow, both of Stanford, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 5, 1979, Ser. No. 100,320

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—350 **10 Claims**



1. A rotation sensing interferometer comprising means for producing an input pulse of electromagnetic radiation, directing means in optical alignment with said electromagnetic radiation producing means for receiving said input pulse of electromagnetic radiation and dividing said input pulse into a concurrent first and a second pulse of electromagnetic radiation, means optically aligned with said directing means for providing a closed path for said first and second pulse to circulate thereabout, coupling means optically interconnecting said directing means with said path providing means for receiving said first and second pulse electromagnetic radiation and for inputting and directing in opposite directions around said path said first and said second pulse, for non-destructively sampling said first and said second pulse after each pass therethrough and for extracting a first and a second pulse sample from said path once each circulation, said directing means being in optical alignment with said coupling means for receiving said first and said second pulse sample and directing said first and said second pulse sample therefrom as an output, detecting means in optical alignment with said directing means for receiving said output and measuring the instantaneous relative phase shift between said first and said second pulse sample and providing an output in the form of a frame of pulses containing phase information and means for receiving said output from said detecting means and converting said phase information into the angle of said rotation or rate of said rotation of said interferometer.

4,323,311

APPARATUS AND METHOD FOR DETECTING HOLES IN SHEET MATERIAL

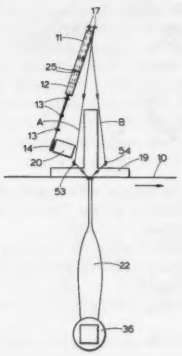
Robert N. West; Patricia A. West, both of Chislehurst; Andrew J. Barker, Orpington, and Rosemary J. Hall, Havant, all of England, assignors to Sira Institute Limited, Chislehurst, England

Filed Apr. 29, 1980, Ser. No. 144,938

Claims priority, application United Kingdom, May 11, 1979, 16525/79

Int. Cl.³ G01N *21/89*

U.S. Cl. 356—431 **31 Claims**



1. Apparatus for detecting holes through opaque or generally opaque sheet material moving in a first direction comprising a radiation source, means for directing a beam of radiation from the source at the sheet material and for scanning the beam thereacross in a direction transverse to said first direction, characterised in that said beam directing means is arranged so that the beam, in use is directed at said sheet material along a path tilted from the perpendicular to the sheet material in an upstream direction with respect to the direction of movement of the sheet material during some scans and in a downstream direction during other scans, means located so as to be on the opposite side of the sheet material to the incident radiation to collect radiation passing through holes in the sheet material, said collection means comprising at least one radiation guide comprising transparent material having a high refractive index relative to its surroundings, a first face of the radiation guide being shaped and positioned to collect the radiation passing through holes in the sheet material, a second face of the radiation guide opposite the first face being shaped to pass the radiation collected by the first face to a radiation detector, and the faces joining the first and second faces being arranged such as to internally reflect radiation from said first face to said second face.

4,323,312

FLUIDIZED BED APPARATUS

Werner Glatt, 7851 Binzen, Krs. Lorrach, and Kurt Bauer, Im Finkeler 4, Freiburg-Tiengen, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 936,955, Aug. 25, 1978, abandoned. This application May 30, 1980, Ser. No. 154,682

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738485; Feb. 9, 1978, 2805397; Feb. 15, 1980, 3005770

Int. Cl.³ B01F *13/02, 15/02*

U.S. Cl. 366—102 **20 Claims**

1. A fluidized bed apparatus comprising

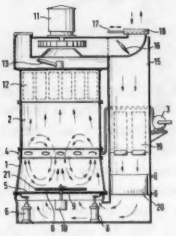
a fluidized bed vessel having walls tapered inwardly as it extends upwardly and having a perforated bottom,

a substantially horizontal rotor disc arranged above said bottom of said vessel,

said rotor disc being of smaller horizontal dimension than the corresponding horizontal dimension of said vessel and forming an annular gap between the circumferential edge of said rotor disc and the upwardly and inwardly tapered wall of said vessel,

means for adjusting the height of said rotor disc connected to said rotor disc and thereby changing the width of said annular gap,

means for rotating said rotor disc about an at least approximately vertical axis connected to said rotor disc,



means for moving a flow of air or other gas into said vessel through said bottom and through said annular gap around the periphery of said rotor disc,

means for releasing material to be treated into the moving gas forming a fluidized bed moved by said rotor disc and the moving gas passing through said annular gap,

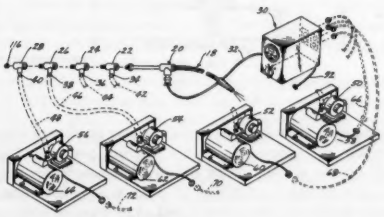
whereby the velocity of the flow of gas through said annular gap is adjusted to the varying density, particle size, and surface characteristics of the material to be treated by varying the height of said rotor disc in relation to said walls of said vessel to decrease said gap and increase flow velocity and alternatively to increase said gap and decrease flow velocity.

4,323,313

IMPREGNATOR SYSTEM

Robert E. Oberg; Clarence E. Stewart, both of South Sioux City, Nebr., and Thomas C. Geelan, Sioux City, Iowa, assignors to The Broyhill Company, Dakota City, Nebr.

Filed Dec. 5, 1979, Ser. No. 100,632
Int. Cl.³ B01F *15/04;* G05D *11/02*
U.S. Cl. 366—142 **1 Claim**



1. In combination,

a fertilizer blending means including a mixing drum for mixing the dry ingredients of a batch of dry fertilizer,

a plurality of electrically driven pumps having their intakes in communication with respective sources of liquid chemicals,

a discharge line extending from the discharge side of each of said pumps,

a liquid line having a discharge portion in communication with the interior of said mixing container,

said discharge lines being in communication with said liquid line,

a check valve in each of said discharge lines adjacent its connection with said liquid line for preventing flow from said liquid line to the associated pump,

an electronic flow sensor means in said liquid line downstream of the connection between said discharge lines and said liquid line for sensing the rate of flow therethrough,

a control means operatively connected to said flow sensor means and to each of said pumps for selectively activating one of said pumps and for deactivating the said one pump when the preselected volume of liquid has passed through said flow sensor means,

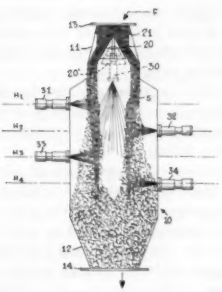
said control means including a selection switch corresponding to the plurality of pumps for selecting the desired pump to be activated; a manually operated dial means for selecting the units of volume of liquid to be pumped by the said pump; a readout means which initially indicates the selected units of volume when said pump is activated; and a countdown means which counts down the units of volume passing through said flow sensor means and sensed thereby; and circuit interruption means for deactivating said pump when the countdown means has caused the readout means to reach zero.

4,323,314

PROCESS AND APPARATUS FOR ADDING LIQUID COMPONENTS TO POURABLE POWDERED OR GRANULAR MATERIALS

Max Kaiser-Wirz, Wintersingerstrasse 23, CH-4465 Magden, Switzerland

Filed Nov. 5, 1979, Ser. No. 91,163
Int. Cl.³ B01F *5/20*
U.S. Cl. 366—167 **2 Claims**



1. A process for continuously adding at least one liquid component to pourable material in a cylindrical vessel having a conical deffector disposed between the pourable material supply and an outlet in the bottom of the vessel, consisting of the steps of;

a. feeding the pourable material into the vessel in such a manner that the material trickles downwardly in the vessel, falling freely in the shape of a hollow cylindrical stream,

b. spraying the interior of the cylindrical stream with a liquid component from at least one nozzle centrally disposed within the deflector,

c. spraying the exterior of the cylindrical stream with a liquid component from at least one nozzle disposed in the wall of the vessel, wherein the only movement which

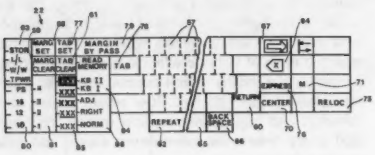
takes place within the vessel is produced by the pourable material, and said at least one liquid component.

4,323,315

ELECTRONIC TYPEWRITER WITH DISPLAY DEVICE

Filippo Demonte, Cavaller Maggiore, and Mario Figini, Bosco Marengo, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 12, 1980, Ser. No. 120,747
Claims priority, application Italy, Feb. 9, 1979, 67280 A/79
Int. Cl.[3] B41J *5/30, 3/46*
U.S. Cl. 400—63 **5 Claims**



1. An electronic typewriter comprising a keyboard for entering data;

a printing unit for printing entered data along printing positions of a printing line;

editing means operable to select an editing state of the typewriter to modify the printing positions of entered data, wherein said editing means include editing selector means and/or editing keys operable according to a selected editing mode, memory means for storing, without printing, said entered data, display means for displaying last entered data, and service keys operable to cause the printing unit to print the data stored in said memory means on modified printed positions of the printing line according to the selected editing mode of said editing selector means and/or editing keys;

word/word selector means operable to select a word/word state of the typewriter for storing, without printing and without modifying the printing positions, a plurality of entered data defining a word;

means responsive to the operation of said service keys including a space bar jointly with selected word/word state of the typewriter for causing the print unit to print said plurality of entered data word by word; and

control means for rendering said word/word selector means ineffective on selection of said word/ word state when said editing selector means and/or editing keys are operated according to a selected editing mode.

3. An electronic typewriter comprising a printing unit for printing entered data,

presetting means for presetting a mode of a plurality of modes producing an emphasis of the entered data by one of underlining print, heavy print, reverse print of entered data and a combination of said ways of emphasis,

a display device of the matrix type comprising dots which are made selectively luminous for displaying the entered data and a row of emphasizing dots below the dots of the matrix, and

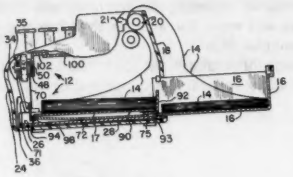
emphasizing means which respond to a preset mode to display in an emphasized manner in relation to the other data the entered data which is to be emphasized by selectively making luminous any of said emphasizing dots according to a predetermined code associated with said mode.

4,323,316

SHORTHAND MACHINE PAPER GAUGE

Paul J. Fowler, Glenview, and Ralph E. Zum Bahlen, Chicago, both of Ill., assignors to Stenograph Corporation, Skokie, Ill.

Filed Feb. 21, 1980, Ser. No. 123,122
Int. Cl.[3] B41J *3/26*
U.S. Cl. 400—91 **12 Claims**



1. A shorthand machine paper gauge for indicating the amount of paper tape remaining in the machine during operation of the shorthand machine, said paper gauge comprising:

(a) scale means adapted to support and weigh a supply of paper tape placed within the shorthand machine, said scale means being mounted for movement related to the weight of the paper within the machine between a first position which will be assumed when no paper tape is within the shorthand machine, a second position which will be assumed when a pre-determined amount of paper tape is within the shorthand machine, and intermediate positions said scale means being resiliently urged toward said first position; and

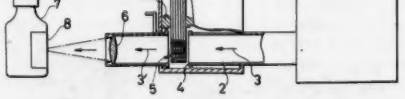
(b) indicating means operatively connected to said scale means to indicate the position of the scale means and thus the amount of paper within the machine.

4,323,317

PATTERN CONTROLLING DEVICE FOR LASER MARKER

Yasuyuki Hasegawa, Kanazawa, Japan, assignor to Shibuya Kogyo Company, Ltd., Ishikawa, Japan

Filed May 7, 1980, Ser. No. 147,683
Int. Cl.[3] B41J *3/02;* **B23K** *9/00*
U.S. Cl. 400—118 **12 Claims**



1. A pattern controlling device for a laser marker in which a laser beam is profiled to a given printing pattern which is marked on the surface of an object; the pattern controlling device comprising a plurality of discs which are rotatably mounted in coaxial relationship and each formed with given patterns which permit the transmission of the laser beam therethrough, each of the rotatable discs being partly disposed in a path of passage of the laser beam so that the patterns on the individual rotatable discs are combined to define the printing pattern, in which the patterns which permit the passage of the laser beam therethrough are formed in patterned discs which are applied to a plurality of circular slots disposed in each

rotatable disc in a concentric circle and centered about the axis of rotation of the rotatable discs and at an equal interval.

4,323,318

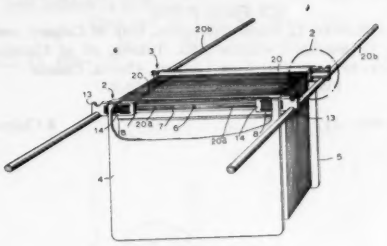
SLIDE COMPRESSION MECHANISM FOR FLEXIBLE POST BINDER

John P. Clark; Jack H. Michaelis, both of Elmhurst, and Frank J. Malcik, Berwyn; all of Ill., assignors to Wilson Jones Company, Chicago, Ill.

Continuation of Ser. No. 551,986, Feb. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 315,789, Dec. 18, 1972, abandoned. This application Jun. 7, 1977, Ser. No. 804,446

Int. Cl.³ B42F *13/06*

U.S. Cl. 402—17 **3 Claims**



1. In a flexible post binder for binding a plurality of looseleaf sheets or the like together, said binder comprising at least one elongated channel having two side rails interconnected by a bottom, each channel having at least one pair of post receiving holes therein each adapted to receive a flexible post extending through aligned holes in the looseleaf sheets, the ends of said posts being adapted to be bent-over within the channel to hold the looseleaf sheets in bound condition, a pair of compressor members each slidably mounted for longitudinal movement on the channel into compressive overlying relationship with one of the bent-over post ends to hold said post end in bent-over condition, each of said compressor members including a major body portion having generally parallel upper and lower sides and extending in a plane between said rails and in overlying relationship to said rails, each compressor also having a pair of substantially parallel reinforcing ribs extending from the underside of its major body portion and into said channel, said ribs being spaced apart sufficiently to guidingly receive a flexible post therebetween, the distance between said rails being a plurality of times greater than the transverse dimension of either of said ribs, and motion limiting means for preventing outward movement of each compressor member beyond a predetermined point on the channel, said motion limiting means comprising:

(a) at least one pair of cooperatively engaging longitudinally aligned stops positioned within the channel with one stop of each pair being a portion of said channel projecting into the path of the other stop; and

(b) said other stop of each pair comprising a shoulder on one of said reinforcing ribs, said one rib having two portions along its length, a first portion of said rib from one end thereof to said shoulder being of such shape and dimension to pass by said one stop, a second portion of said rib beginning at said shoulder being of such shape and dimension as to prevent its passage past said one stop, whereby upon outward movement of each compressor member along the channel the two stops of each pair engage each other to prevent further outward movement of the compressor member beyond said predetermined point;

each compressor member also including a hook portion at one end thereof for supporting the binder on spaced-apart bars, and at least a part of at least one of said ribs extending from the underside of said hook portion to reinforce said hook portion.

4,323,319

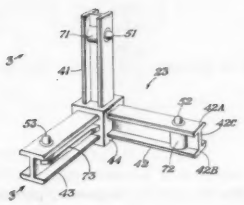
STRUCTURAL CONNECTING MEMBER

Bevoley C. Adams, 2419 J. Weaver St., Fort Worth, Tex. 76117

Continuation of Ser. No. 759,830, Jan. 17, 1977, abandoned. This application Feb. 7, 1978, Ser. No. 875,883

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—171 **2 Claims**



1. A connecting member for connecting a plurality of elongated frame members together to form a desired structure, said elongated frame members having openings formed therethrough and which extend along the length of said frame members, said connecting member comprising:

a plurality of arms having first ends connected together and second ends extending outward in different directions,

said arms comprising integral members molded from a plastic material,

each arm comprising:

two spaced apart portions connected together by an intermediate portion,

a cylindrical shaped member molded to said intermediate portion, the diameter of said cylindrical shaped member being greater than the thickness of said intermediate portion,

an aperture formed into one of said two spaced apart portions and into said cylindrical shaped member,

a movable locking member located in said cylindrical shaped member and comprising a generally hemispherical portion adapted to be moved to outward and inward positions,

said generally hemispherical portion of said locking member extending through said aperture and beyond said one portion of said two spaced apart portions of said arm when said generally hemispherical portion is moved to said outward position,

spring means located in said cylindrical shaped portion and normally urging said generally hemispherical portion of said locking member to said outward position,

said arms having a size in cross-section corresponding to the cross-sectional size of said openings of said frame members such that said arms may be inserted into said frame members and moved to predetermined securing positions,

said generally hemispherical portions of said locking members being movable to their inward positions to allow said arms to be inserted into said openings of said frame members and moved to said securing positions,

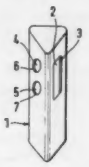
said frame members having apertures formed through the structure thereof communicating with said openings such that when said arms are located at said securing positions in said openings, said generally hemispherical portions of said locking members extend into said apertures of said frame members and secure said frame members to said connecting member.

4,323,320

LIGHT-REFLECTING ARRANGEMENT FOR USE IN TRAFFIC CONTROL DEVICES

Wolfgang Liebrich, and Dieter Schneider, both of Buchen, Fed. Rep. of Germany, assignors to Odenwälder Kunststoffwerke GmbH, Buchen, Fed. Rep. of Germany

Filed Jun. 5, 1980, Ser. No. 156,588
Claims priority, application Luxembourg, Jun. 5, 1979, 81365
Int. Cl.³ E01F *9/00*
U.S. Cl. 404—10 **16 Claims**



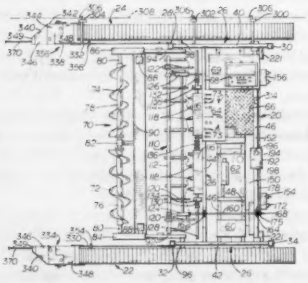
1. A light-reflecting arrangement, particularly for use in traffic control devices such as roadside markers, comprising a support; a stack of light-reflecting plates mounted on said support for successive advancement of the individual light-reflecting plates toward and beyond an operative position in which the respective light-reflecting plate is exposed to act as a reflector; and means for gradually advancing said light-reflecting plates of said stack to replace that light-reflecting plate which may have lost its reflecting capability while dwelling in said operative position by the next-succeeding light-reflecting plate of said stack.

4,323,321

TRACK DRIVEN MACHINES WITH AUXILIARY CABLE-WINCH DRIVE

Charles H. Dale, Rock Island, Ill., assignor to Pav-Saver Mfg. Co., East Moline, Ill.

Filed Apr. 28, 1980, Ser. No. 144,296
Int. Cl.³ E01C *19/12*
U.S. Cl. 404—105 **10 Claims**



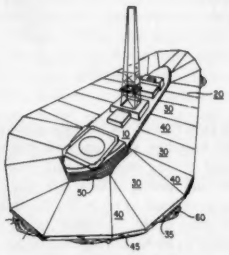
1. A paving machine comprising a frame, means on said frame for spreading and working wet concrete into a strip of wet concrete pavement, at least one endless track on each side of said frame for supporting said frame and the machine components mounted thereon, power drive means including a hydraulic motor for driving at least one track on each of said frame to propel said machine forwardly, a pair of cable winches mounted on respective opposite sides of the forward portion of said machine, a hydraulic motor for driving each winch, a first hydraulic line circuit for supplying hydraulic fluid under pressure to one of the track's hydraulic motor and also the one winch's hydraulic motor on the same side of said machine either simultaneously or individually, and a second hydraulic line circuit for supplying hydraulic fluid under pressure to another track's hydraulic motor and also the other winch's hydraulic motor on the opposite side of said machine either simultaneously or individually, whereby, when cables on one or both respective winches are unwound and secured ahead of said machine, the machine may be propelled forwardly by the tracks alone, the track and winch on one side of said machine and the track alone on the opposite side of said machine, the tracks and winches on both sides of said machine, or the track alone or together with the winch on one side of the machine and the winch alone on the opposite side of the machine.

4,323,322

WARM AIR CANOPY SYSTEM FOR PROVIDING ICE-FREE ZONE

J. Cam O'Rourke; G. Roger Pilkington, both of Calgary, and Frank G. Bercha, Cochrane Alta. Tolowo, all of Canada, assignors to Dome Petroleum Limited, Alberta, Canada

Filed Jul. 5, 1979, Ser. No. 54,997
Int. Cl.³ E02B *15/02*
U.S. Cl. 405—217 **8 Claims**



1. A method for providing a substantially ice-free zone to a predetermined distance around a vessel which is floating on a body of water, comprising the steps of:

(a) floating said vessel on a portion of said body of water in which said substantially ice-free zone o;s to be provided;

(b) creating a finite, substantially enclosed annular zone of water around said vessel above the waterline of said vessel to said predetermined distance away from said vessel, said zone of water having a periphery which encroaches said water at said waterline;

(c) continuously circulating warm air derived from a source of heat from said vessel to said substantially enclosed zone, and withdrawing cooler air from said substantially enclosed zone to said source of heat in said vessel; and

(d) establishing an air/water seal at the location where said zone encroaches said water thereby to prevent ice formation within said annular enclosed zone.

4,323,323

TOOL TIP FOR A MACHINE TOOL

Roland J. Lumby, Selly Oak; Bernard North, Stirchley; Alfred J. Taylor, Solihull, and Roland M. Thomas, Hollywood, all of England, assignors to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 30,474, Apr. 16, 1979, abandoned, which is a continuation of Ser. No. 885,449, Mar. 10, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,506
Claims priority, application United Kingdom, Mar. 17, 1977, 11298/77
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—119 **10 Claims**

1. A cutting tool tip formed at least at a cutting edge of the tip from a ceramic product consisting essentially of at least 75% by volume of a single phase compound having an ex-

panded β-phase silicon nitride lattice and having the general formula $Si_{6-z}Al_zN_{8-z}O_z$, wherein $0<z\leqq 5$ and a second phase containing at least one rare earth metal selected from the group consisting of yttrium, lanthanum, cerium, neodymium, praseodymium and scandium, the ceramic product being produced by sintering a starting mixture consisting essentially of silicon nitride, a silicon aluminium oxynitride other than said expanded β-phase silicon nitride, and at least one oxide of a rare earth metal.

4,323,324

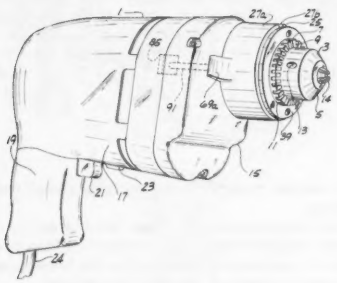
CHUCK BRAKE

Timothy J. Eberhardt, San Francisco, Calif., assignor to Alfred F. Eberhardt and Marvin Coghill, both of Bangkok, Thailand, part interest to each

Filed Apr. 18, 1979, Ser. No. 31,050

Int. Cl.³ B23B *31/06, 31/26*

U.S. Cl. 408—124 **12 Claims**



1. Apparatus for use with a drill tool having a chuck including a chucking element and a housing relatively rotatable with respect to said chucking element for selective tightening or loosening of said chucking element about a tool shank, said apparatus comprising brake means adapted to surround and engage at least a portion of a peripheral surface of said chuck housing, means securing said brake means to said drill tool to permit selective movement of said brake means between a first position relative to said chuck housing freely permitting rotation of said chuck housing and a second position relative to said chuck housing providing friction between said brake means and said chuck housing for frictionally impeding rotation of said chuck housing whereby, upon movement of said brake means to said second position, operation of said drill tool provides selective tightening or loosening of said chucking element.

4,323,325

METHOD OF USING Si_3N_4.Y_2O_3.SiO_2 CERAMIC SYSTEM FOR MACHINE CAST IRON

Shyam K. Samanta, Ypsilanti; Krishnamoorthy Subramanian, Inkster, and Andre Ezis, Grosse Ile, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

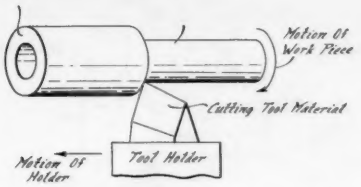
Continuation-in-part of Ser. No. 105,829, Dec. 20, 1979, Pat. No. 4,227,842, which is a continuation-in-part of Ser. No. 954,796, Oct. 25, 1978, abandoned, which is a division of Ser. No. 911,256, May 31, 1978, abandoned. This application Aug. 29, 1980, Ser. No. 182,342

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.³ B32C *1/00;* **C04B** *35/58, 35/50*

U.S. Cl. 409—131 **10 Claims**

1. A process for machine cutting of cast iron stock with a shaped ceramic cutting tool, comprising moving said shaped ceramic cutting tool relative to and in engagement with said cast iron stock to remove a cast iron chip, said ceramic cutting tool being the densified and fused product of compacting and heating together about 4 to about 12% by weight Y_2O_3 with a balance (about 96 to about 88% by weight) consisting essentially of Si_3N_4 until said product has a density of at least 3.25 gms./cm^3.



4,323,326

SELF-DRILLING SCREW

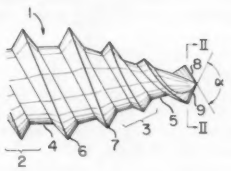
Mitsuo Okada, 576-5, Higashiohtake, Isehara-shi, Kanagawaken; Eiichi Nagoshi, 990, Muroda, Chigasaki-shi, Kanagawaken, and Yoshihisa Matsumoto, 446, Naganuki, Hatano-shi, Kanagawa-ken, all of Japan

Filed Jun. 25, 1979, Ser. No. 52,021

Claims priority, application Japan, Jan. 17, 1979, 54-2914

Int. Cl.³ F16B *25/00*

U.S. Cl. 411—412 **3 Claims**



1. A self-drilling screw having a single screw thread or double screw threads and having a circular cross section at their outer perimeter of the same angle and height, wherein at least one cutting edge of a drill shape is formed by form rolling at an end face of a forward end of the screw thread at a tapering forward end portion of the self-drilling screw, said cutting edge having a lead angle distinct from that of other portions of the self-drilling screw, the screw thread being formed at its root with elevated and depressed areas in a zone of said shank extending across the boundary between a parallel portion and a tapering portion in order to reduce the transverse cross sectional area of the root of the screw thread.

4,323,327

TEMPLATE ALIGNMENT DEVICE

Otto G. Slack, P.O. Box 20293, Portland, Oreg. 97220

Filed Apr. 18, 1980, Ser. No. 141,380

Int. Cl.³ B23P *17/00*

U.S. Cl. 414—28 **5 Claims**

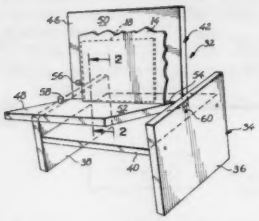
1. Apparatus for aligning a pair of substantially planar templates on opposite sides of a substantially planar board, said apparatus comprising

means defining a first surface for receiving such a board, with one side of the board placed against said surface and with one of the templates placed against the other side of the board,

means defining a second surface for receiving the combination of the board and the one template, with the one template placed against the one side of the board, and

means shiftably mounting said first surface-defining means adjacent said second surface-defining means for shifting between a first position, where said first and second sur-

face defining means are disposed to promote lower edge alignment between the board and the one and another



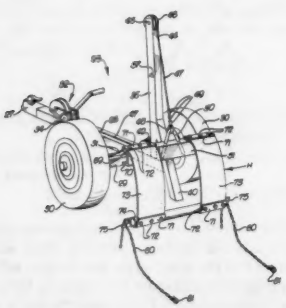
templates, respectively, and a second position enabling flipping of the combination of the one template and the board from said first surface onto said second surface.

4,323,328

VEHICLE HOISTING TOW TRAILER

Michael D. Walsh, III, 5868 Dogwood St., San Bernardino, Calif. 92404

Filed Feb. 13, 1979, Ser. No. 11,871
Int. Cl.³ B60P *3/12*
U.S. Cl. 414—563 **4 Claims**



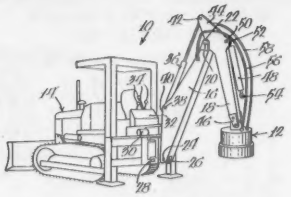
1. In a road vehicle hoisting tow trailer, the combination of:
a central longitudinal axial tow bar having a ball-socket trailer hitch at it's forward end;
twin balloon tired wheel carriage means including a common axle extending equidistantly transversely of and rigidly secured symmetrically to said tow bar at right angles therewith;
a vertical mast rigidly secured to said tow bar near it's rear end;
winch means mounted on said trailer, said winch means including a winch, two co-planar pulleys pivotally mounted in the lengthwise medial axial plane of said tow bar and located at the foot and head of said mast, said winch means also including a cable wound up on and paid out from said winch and being guided by said pulleys to and over said masthead and downwardly therefrom behind said mast;
a transversely symmetrically disposed flexible, rectangular vehicle embracing and hoisting hammock;
means for centrally connecting the rear end of said cable to the front upper end of said hammock;
chain and hook means for temporarily connecting rear lower corners of said hammock to the under structure at one end of a vehicle to be towed;
guide means fixed on and extending forwardly from a middle portion of the front upper end of said hammock and straddling said mast to center the upward movement of said hammock on said mast; and
means for securing said guide means to said mast when said vehicle has been hoisted to the proper level for towing the same, said securing means allowing a substantial degree of rotation of said guide means about said mast to facilitate steering said trailer in towing said vehicle, while retaining a firm tracking grip between the always parallel, widely, co-axially spaced trailer wheels and the ground.

4,323,329

HYDRAULIC-DRIVEN ELECTRO-LIFTING DEVICE

Kenneth J. Chlad, Maple Heights, Ohio, assignor to Magnetics International, Inc., Maple Heights, Ohio

Filed Feb. 21, 1979, Ser. No. 13,056
Int. Cl.³ B66C *1/06*
U.S. Cl. 414—737 **9 Claims**



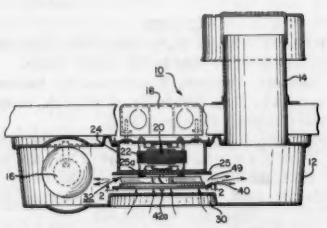
1. A mobile magnetic lifting assembly comprising:
a housing;
an electromagnet retained in said housing and having an exposed magnetic surface for contacting a load to be lifted.
an electric generator disposed within the housing and coupled to provide electrical power to said magnet;
a hydraulic drive motor disposed within said housing and coupled to drive the electric generator;
means coupled through said housing for supplying hydraulic fluid to said hydraulic drive motor; and
suspension means on said housing for enabling removable attachment to a lifting device.

4,323,330

VANELESS DIFFUSER

Richard E. Swin, Sr., Burr Ridge, and Anwar A. Atalla, Willowbrook, both of Ill., assignors to Tec-Air, Inc., Willow Springs, Ill.

Filed Jul. 16, 1979, Ser. No. 57,559
Int. Cl.³ F04D *29/44*
U.S. Cl. 415—207 **8 Claims**



1. An impeller and vaneless diffuser for a mixed flow fan assembly comprising
support means for supporting a plurality of air flow generating blades outwardly therefrom for rotational movement about an axis,
rotation means coupled to the support means for inducing rotational movement of said plurality of air flow generating blades to draw air therepast in a first direction,

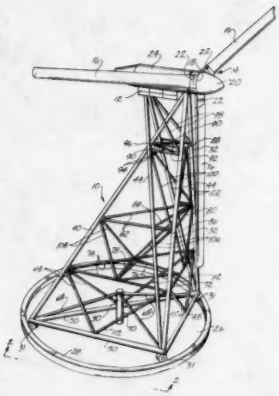
vaneless diffuser means includes a first member operatively coupled to said plurality of air flow generating blades at a free end thereof and extending outwardly therefrom parallel to the axis of rotation of said blades to receive air drawn by said blades, and

said diffuser means further including a second member mounted perpendicular to said first member and extending radially outwardly therefrom to form an outlet to discharge air drawn by said air flow generating blades in a second direction.

4,323,331
WINDMILL TOWER

Charles Schachle, 1032 Grant St., Moses Lake, Wash. 98837; Patrick J. Schachle; Edward C. Schachle, both of 18427 Military Rd. S., Seattle, Wash. 98188, and John R. Schachle, 625 Wellington, #A-12, Walla Walla, Wash. 99362

Filed Apr. 27, 1979, Ser. No. 33,894
Int. Cl.³ F03D *11/04*
U.S. Cl. 416—9 **52 Claims**



1. A windmill tower comprising:

a tower;

a propeller for rotating in a plane forward of the tower;

the tower having a pair of fixed fore legs spaced apart at their bottoms and converging upwardly toward an apex, and a fixed diagonal bracing strut having a bottom spaced aft of the bottoms of the fore legs, with respect to the plane of the propeller rotation, and extending diagonally upwardly toward said apex, the fore legs and the diagonal bracing strut having top portions in the vicinity of said apex spaced aft of the plane of propeller rotation;

a pair of fixed aft legs having top portions spaced aft of said apex, with respect to the plane of propeller rotation, and extending downwardly adjacent opposite sides of the diagonal bracing strut, each aft leg converging downwardly toward the bottom portion of a corresponding fore leg, the aft legs being braced in a fixed position relative to the fore legs;

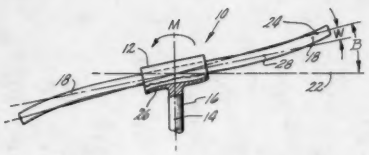
load support means secured to the top portions of the fore legs and the diagonal bracing strut and the aft legs for supporting a load from the propeller; and

means rigidly interconnecting the bottoms of the fore legs and the bottom of the diagonal bracing strut at a base of the tower.

4,323,332
HINGELESS HELICOPTER ROTOR WITH ELASTIC GIMBAL HUB

Evan A. Fradenburgh, Fairfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1979, Ser. No. 106,215
Int. Cl.³ B64C *27/52*
U.S. Cl. 416—134 A **12 Claims**



1. A hingeless helicopter rotor adapted to be mounted for rotation from the fuselage about an axis of rotation and having a low equivalent offset comprising:

(A) a hub mounted for rotation about the axis of rotation and having:

(1) a flexible diaphragm forming the hub bottom wall portion and extending when unloaded in a plane substantially perpendicular to the axis of rotation and being of selected flexibility so as to be tiltable with respect thereto due to elastic deformation in response to blade loading imparted thereto so that the flexible diaphragm acts as an elastic gimbal to produce a constant-speed universal joint action thereacross unaffected by hub tilting, and

(B) a hub center body connected to said hub for rotation therewith and including blade root attachment means to accommodate blade pitch change motion and adapted to receive the blade roots so that the blade centrifugal force is imparted to the hub center body therethrough,

(C) at least three blades extending radially from said hub with equal circumferential spacing therebetween and having root sections connected to the center body blade attachment means for centrifugal force support therefrom and pitch change motion with respect thereto and extending radially therefrom to present blade airfoil sections outboard thereof and to produce lead-lag and flapping motion with respect thereto, so that the blades impose cancelling centrifugal loads on the center body, so that said blades, hub and center body coact to center said blades on said hub, and so that the flexing of the hub and flexing of the blades in response to blade loading coact to produce a low equivalent offset rotor, and to establish the tilt of the rotor blade tip path plane relative to the axis to thereby minimize blade flexing and reduce the angle between the rotor constant speed plane and the blade tip path plane to minimize Coriolis effect, and

(D) means to selectively vary the pitch of said blades both collectively and cyclicly.

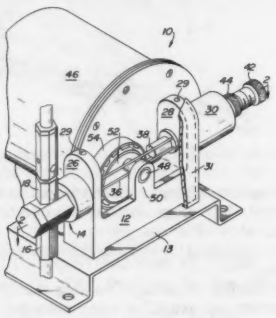
4,323,333
PISTON METERING PUMP

Robert Apter, Wyncote; John Philippi, Horsham; Nicholas Potichko, and Fred. C. Szablewski, both of Lansdale, all of Pa., assignors to R. A. Industries, Lansdale, Pa.

Filed Nov. 23, 1979, Ser. No. 96,951
Int. Cl.³ F04B *21/02*
U.S. Cl. 417—63 **6 Claims**

1. A pump comprising a housing having an inlet and an outlet, a piston assembly including first and second discrete coaxial portions guided for reciprocation, only one of said portions being a piston arranged in a cylinder having inlet and outlet valves, said piston being adapted to pressurize liquid admitted through the inlet and discharged through the outlet, said portions being interconnected only by a pair of third

portions, said third portions each having one end metallurgically bonded to one end face of said first portion and having its other end metallurgically bonded to one end face of said second portion, said third portions being disposed to one side of the axis of said first and second portions to thereby define a gap between said first and second portions, said second portion including a coaxial stroke member adjustably supported thereby for adjusting the effective length of said gap which



determines the effective length of the piston stroke, a motor having an output shaft, an eccentric driven by said motor shaft, said eccentric being disposed in said gap between said stroke member and said first member for causing reciprocation of said piston, and said third portions being rods spaced apart for a sufficient distance so that an end of the output shaft on said motor extends there between, said shaft end being supported by a bearing on said housing.

4,323,334

TWO STAGE LIQUID RING PUMP

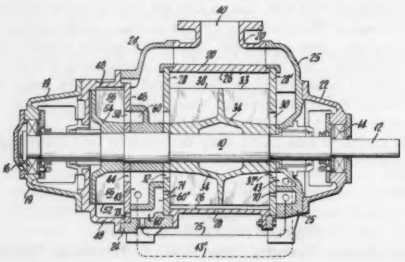
Harold K. Haavik, South Norwalk, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.

PCT No. PCT/US79/00586, § 371 Date Jan. 25, 1980, § 102(e) Date Jan. 25, 1980, PCT Pub. No. WO81/00438, PCT Pub. Date Feb. 19, 1981

PCT Filed Aug. 9, 1979, Ser. No. 121,293

Int. Cl.³ F04C *19/00*

U.S. Cl. 417—68 **9 Claims**



1. In a two-stage liquid ring pump including (1) first and second stages, each stage including (a) a casing, (b) a rotor disposed within the casing, (c) an intake port communicating with an intake stroke area within the casing, and (d) a discharge port communicating with a discharge stroke area within the casing, and (2) interstage conduit means connecting the first stage discharge port to the second stage intake port, the improvement comprising:

a seal liquid unloader orifice in the first stage casing adjacent the first stage discharge stroke area and disposed so that the unloader orifice is normally covered by the ring of seal liquid in the first stage; and

seal liquid conduit means communicating with the unloader orifice outside the first stage casing, the seal liquid conduit means communicating with the second stage discharge port and being maintained at the pressure of the second stage discharge port.

4,323,335

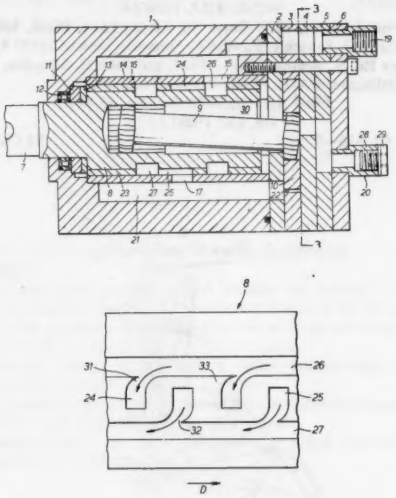
DISTRIBUTOR VALVE FOR HYDRAULIC PLANETARY PISTON MACHINE

Christian B. Hansen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Feb. 28, 1980, Ser. No. 125,504

Int. Cl.³ F01C *1/10, 21/12;* F03C *2/08*

U.S. Cl. 418—61 B **2 Claims**



1. A hydraulic planetary piston machine comprising, a casing, a rotary piston gear in said casing having rotational and orbital movement, a main shaft and a rotary cylindrically surfaced slide valve rotatably mounted in said casing, a cardan shaft having a predetermined direction of rotation connected between said piston gear and said slide valve, said slide valve having two inlet and outlet annular distributor grooves in axially spaced relation, alternately arranged inlet and outlet stub grooves respectively extending axially from and at right angles to said distributor grooves into axially overlapping relation, said inlet stub grooves having curved sections connecting them to said inlet distributor groove, said curved sections being curved towards said predetermined direction of rotation to achieve a scooping effect relative to the ingressing fluid.

4,323,336

INSERTING STICKS INTO CONFECTIONS

Bruce M. Harper, San Jose; Ronald J. Billett, Sunnyvale; Thomas E. Roberts, Saratoga, and Veikko K. Viitanen, San Jose, all of Calif., assignors to FMC Corporation, Chicago, Ill.

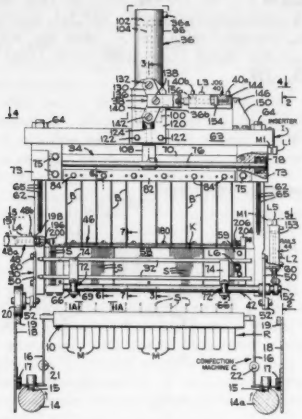
Filed May 5, 1980, Ser. No. 146,935

Int. Cl.³ B29D *3/00;* B29C *1/00*

U.S. Cl. 425—126 S **27 Claims**

1. Apparatus for forming frozen molded confections, said apparatus being of the type comprising a plurality of shiftable molds each formed with a row of generally rectangular section mold cavities and a stick inserter for simultaneously inserting

flat faced sticks into the confections in the mold cavities, the mold cavities in a row being disposed transversely of the row axis, said stick inserter comprising means for forming a packed column of sticks, said sticks being disposed so that their flat



faces are also transverse to the row axis and the sticks are located in a vertical plane and directly above the mold cavities and means for inserting sticks directly from the column into the mold cavities of a row.

4,323,337

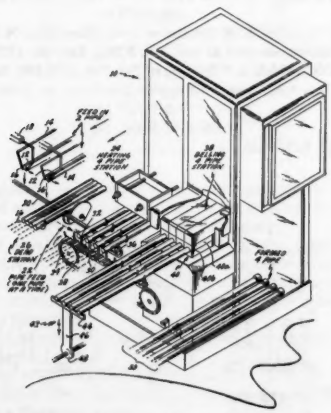
SELECTIVE MULTIPLE PIPE COMPRESSION BELLING MACHINE

Wolfram G. Korff, 12153 Gerald Ave.; Vernon V. Emery, 16852 Knollwood Dr., both of Granada Hills, Calif. 91344, and Joseph K. Bond, 8007 Shadyglade Ave., North Hollywood, Calif. 91605

Division of Ser. No. 808,070, Jun. 20, 1977, abandoned. This application Nov. 3, 1978, Ser. No. 957,351

Int. Cl.[3] B29D *23/00*

U.S. Cl. 425—155 **2 Claims**



1. A pipe belling machine capable of a high rate of production and having a dead station at which the pipes to be belled are lying side by side awaiting advancement along a predetermined path in a forward direction perpendicular to their elongated dimension, and in which the incoming pipes are being urged foward at all times along the predetermined path, said pipe belling machine comprising:

an escapement device including a shaft selectively rotatable and located below the predetermined path with its axis of rotation extending substantially in the forward direction, including a first gate affixed to said shaft and lying substantially in a plane perpendicular to the axis of the shaft, and shaped to lie entirely below the path of the first waiting pipe during a portion of each revolution to permit the pipe to advance past it in the forward direction, and shaped to lie at least partially in the path of the remaining waiting pipes during the remainder of each revolution to block further forward motion of the remaining waiting pipes, and further including a second gate affixed to said shaft and lying substantially in a plane perpendicular to its axis and spaced axially along said shaft forward of said first gate a distance approximately equal to the diameter of one of the pipes and shaped to lie at least partially in the path of a pipe advanced from the first gate during the time the first gate lies entirely below the path of the first waiting pipe to block further forward motion of the pipe advanced from the first gate and shaped to lie entirely below the path of the pipe advanced from the first gate during a part of each revolution to permit that pipe to advance forward beyond the second gate, the first gate and the second gate being affixed to the shaft at such relative rotational positions that the first gate lies at least partially in the path of the waiting pipes when the second gate lies entirely below the path of the pipe advanced from the first gate to block unrestricted forward motion of the remaining waiting pipes;

positioning means establishing a sequence of stops which are successively extended into the path taken by the objects released from said escapement device between successive pipes for restraining their forward motion and maintaining their spacing, the sequence of stops having a predetermined spacing in the forward direction and being selectively movable in that direction while extended between successive pipes;

control means for controlling the forward motion of the sequence of stops and for selectively rotating the shaft one full revolution each time said positioning means has advanced by one stop, to selectively discharge a pipe behind a newly-extended stop;

said positioning means and said control means cooperating for selectively placing pipes at a group of predetermined spaced locations along a line of motion, and for maintaining the relative spacing of the pipes as they are transferred as a group from a heating station to a belling station and as they are transferred as a group from the belling station to an output station;

a multiple-pipe heating station for simultaneously heating the ends of a group of pipes; and,

a multiple-pipe belling station for simultaneously belling a group of pipes.

4,323,338

APPARATUS FOR ORIENTATION AND DEPOSITION OF DISCRETE LIGNOCELLULOSIC MATERIALS

Thomas E. Peters, and John M. Bateman, both of Boise, Id., assignors to Morrison-Knudsen Forest Products Company, Inc., Boise, Id.

Division of Ser. No. 106,686, Dec. 26, 1979, Pat. No. 4,287,140. This application Feb. 25, 1981, Ser. No. 237,912

Int. Cl.[3] B28B *17/00*

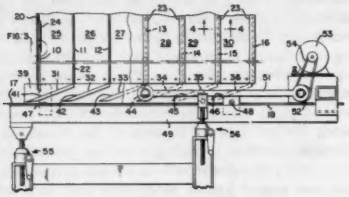
U.S. Cl. 425—174.8 E **18 Claims**

1. Apparatus for the manufacture of mats of aligned lignocellulosic particles employed in the manufacture of comminuted pressed lignocellulosic products having directional qualities, comprising:

an electrically insulative transfer surface for receiving a multitude of discrete lignocellulosic particles thereon to form a mat thereof;

an electrically conductive mat-receiving surface maintained at ground potential positioned adjacent the discharge end of the transfer surface to receive the mat;

means for establishing and maintaining a directional electric



field immediately above the transfer surface to align the particles making up the mat; and

means for transferring the aligned mat from the transfer surface to the mat-receiving surface maintained at ground potential.

4,323,339

DEVICE FOR MANUFACTURING PLASTICS PIPES WITH OBLONG CHANNELS

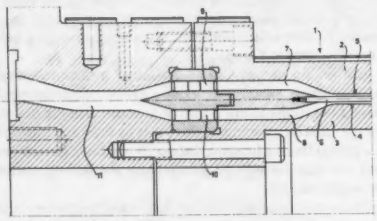
Johan de Kok, Hardenberg, and Jan P. van Dongeren, Bergentheim, both of Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Division of Ser. No. 648,755, Jan. 13, 1976, abandoned. This application May 7, 1980, Ser. No. 147,391

Claims priority, application Netherlands, Jan. 13, 1975, 7500386

Int. Cl.³ B29D *23/04*

U.S. Cl. 425—199 **4 Claims**



1. A device for performing the manufacturing of plastic pipes, comprising:

an extruder with an annular mouth piece, being defined by a core and a casing with a plurality of adjacent pins in an annular space, being defined by an outer wall of the core and an inner wall of the casing, said annular space having a cross section which is adapted to a cross section of channels to be formed,

means for regulating the passage of synthetic material being provided between the outer wall of the core and the inner wall of the casing in an area between two of the plurality of adjacent pins,

one row of said plurality of adjacent pins being concentrically situated relative to the core and the casing;

wherein at least one of the inner wall of the casing and the outer wall of the core is provided with corrugated ridges in the area between two adjacent pins; and

whereby the formation of longitudinally extending deformations in the plastic pipes being manufactured is substantially avoided.

4,323,340

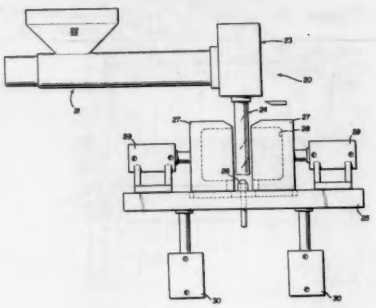
APPARATUS FOR MAKING PLASTIC ARTICLES

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 854,555, Nov. 25, 1977, which is a continuation of Ser. No. 670,936, Mar. 26, 1976, abandoned, which is a continuation of Ser. No. 461,361, Apr. 16, 1974, abandoned. This application Jun. 30, 1980, Ser. No. 164,664

Int. Cl.³ B29D *23/04*; B29C *3/00, 17/07*

U.S. Cl. 425—325 **1 Claim**



1. In an apparatus including a plastic shaping means for making a plastic article by known plastic forming techniques performed exteriorly of an orifice from which the material issues in a formable thermoplastic state, the improvement comprising the combination of means for plasticizing a body of thermoplastic material at a first pressure and a first temperature, means for cooling said body to a second, lower temperature more conducive to orientation, said orifice communicating with said body, power means for progressively advancing at least a portion of said body toward and through said orifice at a second, higher pressure while said portion is at said second temperature, and means for repeatedly and progressively nonlinearly shearing said portion during its advance toward said orifice to biaxially orient the same.

4,323,341

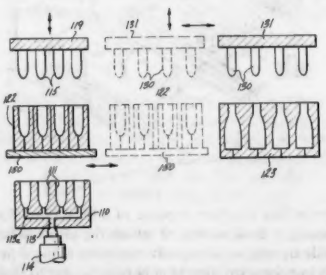
APPARATUS FOR FORMING HOLLOW PLASTIC OBJECTS

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 5,962, Jan. 24, 1979, Pat. No. 4,234,302, which is a division of Ser. No. 911,359, Jun. 1, 1978, Pat. No. 4,207,134. This application Mar. 11, 1980, Ser. No. 129,389

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—526 **8 Claims**



1. A blow molding apparatus for forming a plurality of oriented, blown, hollow plastic articles of moldable plastic

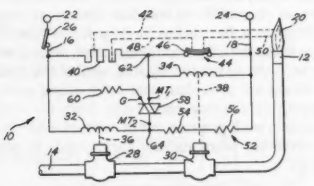
material which comprises: a plurality of first molds for receiving and tempering a plurality of parisons in spaced relationship to each other to optimize the parison temperature for orientation and blowing; means for changing the center spacing of said first molds from a first to a second center spacing; a plurality of second molds in spaced relationship to said first molds for forming said parisons into oriented, blown, hollow plastic articles, said second molds being in fixed spaced relationship to each other corresponding to said second center spacing; a plurality of first means in fixed spaced relationship to each other corresponding to said first center spacing engageable with said first molds at said first center spacing for placing parisons therein for tempering; means for changing the relative position of said first molds from a position adjacent said first means to a position away from said first means, wherein said means for changing the center spacing is operative to change the center spacing independent of said means for changing the position of said first molds from a position adjacent said first means to a position away from said first means; plaate means which holds said first molds and which is capable of being moved with said first molds from station to station; track means on said plate means and engaged with said first molds which define the limits of the movement which changes the center spacing of said first molds; motive means for moving said first means into and out of engagement with said first molds; a plurality of second means in fixed spaced relationship to each other corresponding to said second center spacing engageable with said first molds at said second center spacing and engageable with said second molds for removing the tempered parisons from the first molds and placing same into said second molds for final processing; motive means for moving said second means into and out of engagement with said first and second molds, respectively; and means associated with said second molds for forming said parisons into oriented, hollow plastic articles.

4,323,342

BURNER IGNITION AND CONTROL SYSTEM

Edward G. Sommers, Jr., and James G. O'Connor, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 9, 1980, Ser. No. 110,723
Int. Cl.³ F23M *5/00*
U.S. Cl. 431—66 **13 Claims**



1. An ignition and control system for operating a burner from a fuel supply conduit and a pair of controlled electrical power input conductors, said system comprising:

a pair of electromagnetically operated solenoid valves each having a winding for opening the respective valve when energized, said valves connected in series with the conduit and operable to supply fuel to the burner only when both valves are open;

an electrically operated igniter for igniting fuel issuing from the burner;

a sensing switch having normally closed contacts which open either when said igniter is in an ignition condition or when a flame is present;

said igniter and one of said valve windings being electrically connected in series between the power input conductors, and said sensing switch contacts being connected in shunt across said one of said valve windings, such that, when the power input conductors are energized and said sensing switch contacts are closed, said igniter is energized and said one of said valve windings is not energized, and, when the power input conductors are energized and said sensing switch contacts are open, said igniter is effectively de-energized and said one of said valve windings is energized;

a holding current impedance element electrically connected in series with the other of said valve windings between the power input conductors, said holding current impedance element being selected such that current passed through said impedance element alone is insufficient to operate the other of said valves, but sufficient to maintain the other of said valves in an operated condition once operated;

a controlled switching element having a pair of main switch terminals and a control input terminal, said controlled switching element operable to conduct between said main switch terminals when a signal is applied to said control input terminal with reference to one of said main switch terminals, and operable to cease conducting when the control input signal is not present; and

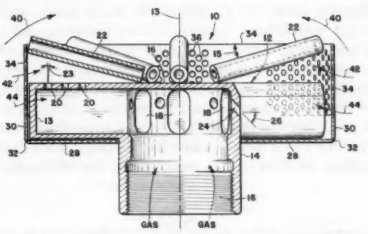
said controlled switching element being electrically connected so as to conduct and effectively shunt said holding current impedance to cause operation of the other of said valves when the power input conductors are energized and said sensing switch contacts are closed, and to cease conducting when said sensing switch contacts are open.

4,323,343

BURNER ASSEMBLY FOR SMOKELESS COMBUSTION OF LOW CALORIFIC VALUE GASES

Robert D. Reed, and Robert E. Schwartz, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 4, 1980, Ser. No. 118,613
Int. Cl.³ F23D *13/20*
U.S. Cl. 431—202 **5 Claims**



1. Apparatus for burning low calorific gases in smokeless combustion comprising:

(a) at least one burner head mounted on the top of a vertical pipe, through which said low calorific gases are supplied;

(b) a plurality of hollow arms inserted into the wall of said head arranged in equally-spaced radial array in a common horizontal plane, said arms closed at their outer ends;

(c) a plurality of ports of selected diameter and selected spacing near the outer ends of said arms drilled through the tops of said arms; the direction of the axes of said ports inclined toward the vertical axis of said head, at a selected angle A;

(d) at least one port drilled through the circumferential wall of the central hub of said head in each of the spaces between adjacent radial arms; the angle of said at least one port being at a selected angle B down from the horizontal, from the inside of the hub to the outside;

(e) the pressure of said gas supplied to said head being such that the velocity of the jets of gas flowing from said ports is excessive and up to critical;

(f) an annular circular plate positioned in contact with the

bottom surfaces of said arms closing off the spaces between said arms; and

(g) a thin cylindrical wall surrounding the ends of said arms in contact at its bottom edge with the outer edge of said annular plate, and rising a selected distance above said arms; a plurality of openings in said wall of a selected size in a selected symmetrical pattern over substantially the entire area of said wall.

4,323,344

APPARATUS FOR HEAT TREATING FINE-GRAIN MATERIAL

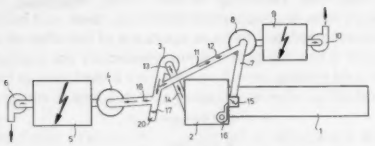
Hans-Dieter Grudno, Beckum, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,452

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1979, 2940676

Int. Cl.³ F27B *7/02*

U.S. Cl. 432—106 **6 Claims**



1. In apparatus for heat treating fine-grain material having a rotary kiln, a preheater for such material communicating with said kiln, a kiln waste gas fan for delivering waste gases from said kiln to said preheater, first dedusting means for dedusting kiln waste gases, conduit means establishing communication between said preheater and said first dedusting means, second dedusting means for dedusting kiln waste gases, and a bypass conduit establishing communication between said preheater and said second dedusting means, the improvement comprising a connecting conduit establishing communication between said second dedusting means and said fan at its pressure side, adjustable throttling means in said connecting conduit for enabling and disabling the flow of kiln waste gases therethrough, and adjustable valve means in said bypass conduit for enabling and disabling the flow of kiln waste gases therethrough.

4,323,345

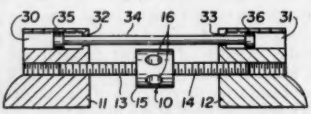
ORTHODONTIC BIASSING DEVICE WITH SCREW DISENGAGEMENT PREVENTING MEANS

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Division of Ser. No. 785,587, Apr. 7, 1977, Pat. No. 4,200,979. This application Nov. 19, 1979, Ser. No. 95,378

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—7 **56 Claims**



1. An orthodontic biassing device comprising:

two oppositely disposed body members adapted to engage one or more teeth and to be spaced from each other, each of said body members having a threaded bore directly formed therein, said threaded bores being oppositely threaded;

an elongated threaded member having oppositely threaded end portions which are respectively threadably engaged in the threaded bores of said body members to selectively expand or contract the spacing between said body members;

first abutment means directly formed on at least one of said body members; and

retaining means coupled to and being movable relative to said at least one of said body members for abuttingly engaging with said first abutment means on said at least one of said body members for positively preventing relative movement between said elongated threaded member and said body members when the spacing between said body members is expanded to a predetermined spacing, thereby preventing disengagement of said elongated threaded member from said body members.

4,323,346

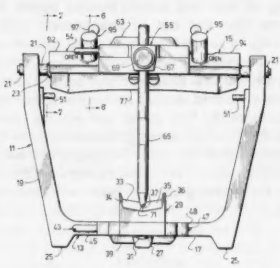
DENTAL ARTICULATOR

Richard A. Beu, Eggertsville, N.Y., assignor to Teledyne Hanau, a division of Teledyne, Inc., Buffalo, N.Y.

Filed Jan. 10, 1980, Ser. No. 111,020

Int. Cl.³ A61C *11/00*

U.S. Cl. 433—58 **6 Claims**



1. In a dental articulator for simulating relative jaw and tooth movements, which includes a pair of simulated condyles on a lower mounting means which simulates a part of a lower jaw, and a simulated maxilla, mountable on the condyles and movable with respect to the condyles to simulate forward and sideward jaw movements, which maxilla, where it is mountable on the condyles, includes medial, superior and posterior joint walls so shaped as to simulate fossae, an improvement which comprises a flat spring in strip form, bent at the ends thereof to form anterior condylar joint walls, which ends yieldably hold the simulated maxilla against the condyles, and in which means are provided, near both spring ends, for selectively moving said spring ends away from the condyles and holding them in such position out of contact with the condyles, and for selectively allowing said spring ends to press against the condyles.

4,323,347

DENTAL TOOL FOR USE WITH DENTAL RETAINING SPLINTS

Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

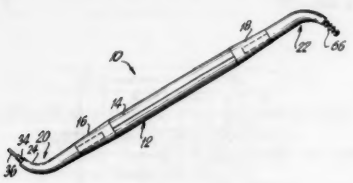
Continuation-in-part of Ser. No. 70,247, Aug. 27, 1979, Pat. No. 4,260,383. This application Sep. 17, 1980, Ser. No. 188,026

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—141 **8 Claims**

1. A dental tool comprising an elongated handle with a splint manipulating device at one end thereof, said manipulating device including an extended body portion, an elongated foot portion transversely positioned at a distal end of said body portion for entering into an elongated slot provided in a wall of a dental retaining splint, said foot portion extending perpendicularly outwardly in opposite directions from said body portion so that said foot portion locks against an outer surface of the splint wall, spring means for abutting against an opposite inner

surface of the splint wall to retain the splint, said spring means including a compression spring having a first end disposed on said body portion and a second opposing end extending freely towards said foot portion, said second spring end being free and resiliently movable towards and away from said foot portion, said compression spring having a size greater than said



elongated foot, and said body portion including means for retaining said first end of said compression spring on said body portion, whereby with said foot portion locked beneath the elongated slot, the dental splint is sandwiched between said foot portion and second said spring end, the dental splint being held by said foot portion against the resilient action of said compression spring.

4,323,348

DENTAL COMPOSITIONS

Robert Schmitz-Josten, Cologne; Manfred Borgardt, Wuppertal; Hans-Hermann Schulz, Leichlingen, and Michael Walkowiak, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 31, 1980, Ser. No. 173,945

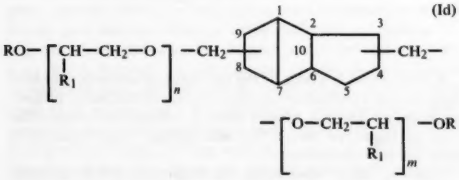
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931926

Int. Cl.³ A61K *6/08*

U.S. Cl. 433—228 **17 Claims**

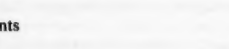
1. A dental composition comprising a polymerisable (meth-)acrylic acid ester of the formula

(Id)



in which

R represents



R_1 represents a hydrogen atom or a methyl or ethyl group, and

n+m represents a number from 1 to 10; and one or more inert dentally acceptable carriers.

4,323,349

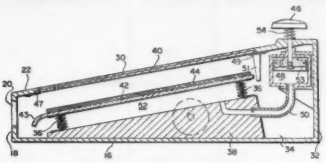
NOVEL TEACHING METHOD AND APPARATUS

Edward Maltzman, 35 Bellingham Rd., Chestnut Hill, Mass. 02167, and Herman E. Erikson, 127 Ridge St., Winchester, Mass. 01890

Continuation-in-part of Ser. No. 658,374, Feb. 17, 1976, abandoned. This application Aug. 18, 1977, Ser. No. 825,661

Int. Cl.³ G09B *17/00*

U.S. Cl. 434—184 **19 Claims**



1. A method for improving motor-perceptual learning of an individual comprising the steps of:

(1) providing lesson material to be reproduced;

(2) rendering said lesson material visible and thereby traceable for an initial predetermined period of time;

(3) commencing said reproduction of said lesson material by tracing a portion thereof;

(4) rendering said lesson material non-visible at the end of said predetermined period of time and before said reproduction can be completed by tracing;

(5) reproducing from memory all or at least a further portion of the remaining subject matter not reproduced by tracing; and

(6) if said reproduction is not completed, repeating said steps 2 to 5 of rendering said lesson material visible, tracing, rendering said lesson material non-visible and reproducing from memory until said lesson material has been reproduced.

4,323,350

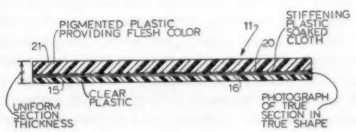
ANATOMICAL MODEL

Robert L. Bowden, Jr., Rte. 2, Box 295, Germantown, N.C. 27019

Filed Sep. 22, 1980, Ser. No. 189,805

Int. Cl.³ G09B *23/30*

U.S. Cl. 434—269 **2 Claims**



1. An anatomical model for simulating a selected uniformly sectioned portion of a deceased body, comprising:

(a) a plurality of sections of uniform thickness adapted to be assembled in serial order to simulate in a corresponding serial order the assembly of sections making up the body portion on which the model is based with each said section comprising a structure made up of:

(i) a first optically clear plastic layer;

(ii) a color photograph covered by and viewable through said layer and comprising a color photograph of the inferior side of a corresponding section of said selected body portion and showing the natural color and shape thereof;

(iii) a stiffening member adhered to the back of said photograph; and

(iv) a second plastic layer adhered to said stiffening member and colored in a flesh tone corresponding to a flesh color

found in said selected body portion and having a thickness selected to provide said uniform section thickness; and

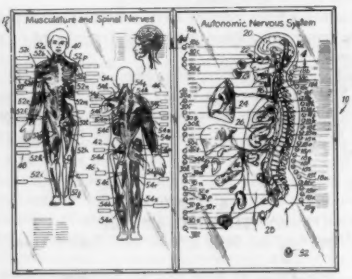
(b) said sections being contoured such that each section and the photograph thereon represents the actual true-to-life appearance in color and the actual contour of a corresponding section in said selected body portion and when assembled in the corresponding serial order is adapted to mate with all other sections to simulate the actual shape of said selected body portion on which said model is based.

4,323,351

VISUAL DISPLAY APPARATUS FOR THE DISPLAY OF THE AUTONOMIC NERVOUS SYSTEM AND MUSCULATURE AND SPINAL NERVES AND RELATED METHOD

Bruce W. Goldsmith, Kerhonkson, N.Y., assignor to Space Odyssey Ltd., Kerhonkson, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,543
Int. Cl.³ G09B *23/30*
U.S. Cl. 434—274 **15 Claims**



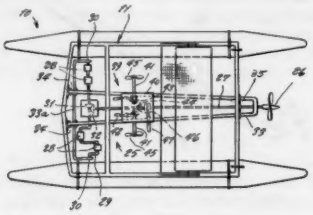
1. Display apparatus comprising display means for displaying a human spine including a plurality of vertebrae and for displaying a plurality of human organs physiologically associated with said vertebrae, illumination means for illuminating said organs, control means positionally corresponding to respective of said vertebrae and adapted for being individually operated to modify the illumination of respective of said organs, said control means including switches respectively positioned adjacent said vertebrae and electric circuitry coupling said switches to said illumination means to modify the illumination of the corresponding organs, supplemental control means coupled to said illumination means for illuminating selective of the said organs independently of the vertebrae, said illumination means including a first plurality of lamps coupled via said electric circuitry to said switches and a second plurality of lamps coupled to said supplemental control means, and supplemental display means for displaying musculature inclusive of a plurality of physiologically related muscles, musculature lamps for illuminating respective of said muscles, said muscles being physiologically related to said organs, musculature switches for selectively operating said musculature lamps, and electric circuit means coupling said musculature switches and musculature lamps to said supplemental control means such that operation of the supplemental control means illuminates said organs and muscles selectively and operation of the musculature switches illuminates said organs and operates said musculature lamps selectively.

4,323,352

CERF CYCLE

William Warren, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 14, 1980, Ser. No. 111,880
Int. Cl.³ F16H *37/06*
U.S. Cl. 440—27 **2 Claims**



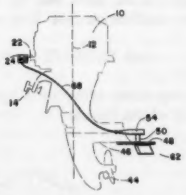
1. A cerf cycle craft for travel upon a water surface, comprising in combination, an angle iron frame mounted upon a pair of spaced apart pontoons, a windshield, a seat and a foot powered drive mechanism mounted on said frame, said mechanism including means for moving said craft in either a directly forward, rearward, either side or in intermediate directions therebetween wherein said mechanism includes a first propeller along a first shaft extending longitudinally of said craft, and a pair of second propellers each of which is on a transverse shaft, and clutch means for selective engagement of said shafts with a crankshaft fitted with foot pedals.

4,323,353

BOAT STEERING APPARATUS

Creal E. Kirkwood, Wagoner, Okla., assignor to Incom International, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 55,615, Jul. 9, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 226,467
Int. Cl.³ B63H *25/42*
U.S. Cl. 440—63 **11 Claims**



8. For use with a boat of the outboard or inboard-outboard type having a reciprocating boat steering means and a propeller assembly which is rotated about a vertical axis to steer the boat, an improved means for reducing the force required to steer the boat comprising:

coupling means connecting the reciprocating boat steering means to the propeller assembly permitting limited movement of the steering means before rotation of the propeller assembly;

a fin supported on the bottom of a vertical shaft, the shaft being rotatably supported to the propeller assembly, whereby the fin is positioned in the propeller slip stream;

a horizontal actuator plate affixed to the shaft upper end;

means to connect said horizontal actuator plate to said coupling means whereby when said boat steering means is displaced, said fin is rotated to apply steering force to the propeller assembly, when a slip stream exists, before the steering means applies force directly to rotate the propeller assembly; and

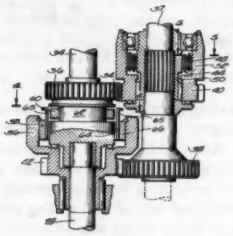
means controllable remotely from said coupling means for selectably locking the boat steering means to the propeller assembly whereby displacement of the boat steering means directly rotates the propeller assembly.

4,323,354

TWO-SPEED AUTOMATIC TRANSMISSION FOR A MARINE PROPULSION DEVICE

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 15, 1979, Ser. No. 12,385
Int. Cl.³ B63H *1/14*
U.S. Cl. 440—75 **55 Claims**



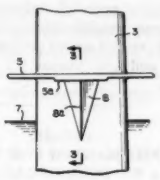
1. A marine propulsion device comprising an input shaft drivingly connected to a power source, a lower unit having a rotatably mounted drive shaft extending in coaxial relation to said input shaft, a rotatably mounted propeller shaft carrying a propeller, and means drivingly connecting said drive shaft to said propeller shaft, and a two-speed transmission drivingly connecting said input shaft to said drive shaft, said transmission being shiftable between speed ratios solely in response to variation in the speed of said input shaft and including a first drive means between said input shaft and said drive shaft for selectively drivingly connecting said input shaft and said drive shaft and including a third shaft rotatably mounted in parallel relation to said input shaft and said drive shaft, a first drive gear mounted on said input shaft, a first driven gear mounted on said third shaft and in meshing engagement with said first drive gear, a second drive gear mounted on said third shaft, a second driven gear mounted on said drive shaft and in meshing engagement with said second drive gear, and a one-way overrunning clutch drivingly connecting one of said shafts to a gear mounted on said one shaft when the rotational speed of said input shaft is less than a predetermined value, said first drive means having a first input-output speed ratio with a first value, said first drive means further including means fixedly connecting three of said first drive gear to said input shaft, said third shaft to said first driven gear, said third shaft to said second drive gear, and said second driven gear to said drive shaft, and said one-way overrunning clutch connecting the other of said first drive gear to said input shaft, said first driven gear to said third shaft, said third shaft to said second drive gear, and said second driven gear to said drive shaft, and second drive means for selectively drivingly connecting said input shaft and said drive shaft when the rotational speed of said input shaft is greater than said predetermined value, said second drive means including a selectively actuatable clutch for drivingly connecting said input shaft and said drive shaft and having a second input-output speed ratio with a second value greater than said first value.

4,323,355

SPLASH PLATE FOR MARINE PROPULSION DEVICES

Yasuo Kondo, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 21, 1980, Ser. No. 123,281
Claims priority, application Japan, Mar. 6, 1979, 54-25960
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—76 **7 Claims**



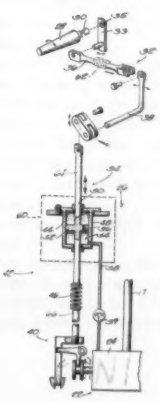
1. In combination with a marine propulsion device for mounting to a boat hull rearwardly and outboard thereof, and having a casing intended to be at least partially immersed in water through which water the hull is to be forwardly propelled, a splash plate mounted to said casing and projecting forwardly from said casing at an elevation such that it will be positioned above the water surface during normal cruising, said splash plate having a lower surface to deflect water splashed by the casing, said lower surface being shaped so that a forward portion thereof is lower than a rear portion thereof.

4,323,356

MARINE TRANSMISSION CONTROL WITH VIBRATION ISOLATION SYSTEM

Donald K. Stephenson, Sussex, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 23, 1979, Ser. No. 14,696
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—86 **7 Claims**



1. A marine propulsion device comprising a marine propulsion unit including an engine, a rotatably mounted propeller, transmission means operatively connected with said engine and said propeller for operation between a neutral position in which said engine is operatively disconnected from said propeller and a drive position in which said engine powers said propeller, said transmission means including a gearcase housing having confined therein an incompressible lubricating oil, and control means for operating said transmission means between said neutral position and said drive position, said control means including a movable control handle, a shift rod opera-

tively connected between said control handle and said transmission means, having a longitudinal axis, and movable axially along said longitudinal axis in response to operative forces imparted by the movement of said control handle and in response to vibratory forces imparted by operation of said transmission means, and damper means for resisting the transmission of vibratory forces and comprising a cylinder enclosing a portion of said shift rod, a piston attached to said portion of said shift rod and movable within said cylinder in common with the movement of said shift rod axially along said longitudinal axis, and incompressible lubricating oil contained within said cylinder, and conduit means communicating between said gearcase housing and said cylinder for conducting lubricating oil therebetween.

4,323,357

CONNECTING MECHANISM FOR TWO MEMBERS OF A BICYCLE DERAILEUR

Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 9, 1980, Ser. No. 138,737

Claims priority, application Japan, Apr. 23, 1979, 54-55107[U]

Int. Cl.[3] **F16J** *15/34;* **F16C** *33/72;* **F16H** *11/00*

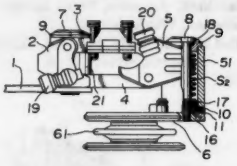
U.S. Cl. 474—82 **11 Claims**

1. A connecting mechanism which rotatably connects a first member and a second member of a bicycle derailleur, said first member including a supporting tubular member having first and second lengthwise end portions, said second member having a headed shaft insertable into said supporting tubular member, said connecting mechanism comprising:

a first bearing interposed between the first end portion of said supporting tubular member and the head of said shaft;

a second bearing interposed between the second end portion of said supporting tubular member and said second member;

each of said first and second bearings comprising a tubular portion inserted between the inner periphery of said supporting tubular member and the outer periphery of said shaft and a flange portion disposed opposite to the end face at each of said end portions of said supporting tubular member, the flange portion of at least one of said first and second bearings having an annular groove opening at one axial side of said flange; and



an annular sealing member loosely fit into said groove, said sealing member comprising elastic material and being elastically deformable within said groove, said sealing member having a height greater than a depth of said groove, and projecting from the opening of said groove, the projecting end face of said sealing member elastically contacting with one of the second member and at the end face of said tubular member opposite to said one axial side of said flange, on which side said groove is opening.

4,323,358

METHOD FOR INHIBITING MINERALIZATION OF NATURAL TISSUE DURING IMPLANTATION

David J. Lentz, Mission Viejo, and Elisabeth M. Pollock, Yorba Linda, both of Calif., assignors to Vascor, Inc., Anaheim, Calif.

Filed Apr. 30, 1981, Ser. No. 259,762
Int. Cl.³ A61F *1/22*
U.S. Cl. 8—94.11 19 Claims

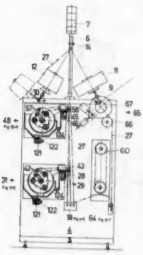
1. A method for inhibiting the mineralization of fixed natural tissue after implantation in a living body comprising contacting fixed natural tissue intended for implantation with an aqueous solution of a water soluble salt of a C_{7-18} alkyl sulfate.

4,323,359

MACHINE FOR THE CONTINUOUS WET TREATMENT OF TEXTILE THREAD FORMATIONS, THE PROCESS FOR OPERATING THE MACHINE, AS WELL AS A NON-TOUCHING CATCH-THREAD DEVICE

Werner Keller, Winterthur, Switzerland, assignor to Jaeggli Maschinenfabrik AG, Räterschen, Switzerland

Filed Mar. 6, 1980, Ser. No. 127,559
Claims priority, application Switzerland, Mar. 23, 1979, 2716/79
Int. Cl.³ D06B *23/04*
U.S. Cl. 8—155 4 Claims



1. A process for treating thread formations comprising:

providing a first wetting station for treating a thread formation, said first wetting station having a first reel comprising a central spindle rotatably mounted in a housing along a first axis and a plurality of rollers each rotatably mounted about said central spindle in said housing along axes parallel to said first axis;

providing drive means operatively engaging said first reel, said drive means being operative in a first condition wherein said spindle rotates on said first axis while said rollers orbit about said spindle and a second condition wherein said spindle is stationary and said plurality of rollers rotate on their axes respectively;

mounting thread guide means for axial movement on a second axis parallel to and spaced apart from said first axis for feeding said thread formation over the length of said first reel;

feeding said thread formation to said thread guide means and said first reel when said drive means is operatively engaging said first reel in said first condition for spooling said thread formation on said first reel;

providing a treatment bath in said housing of said first wetting station;

treating the spooled-up thread formation on said first reel in said treatment bath; and

feeding the treated thread formation off of said first reel when said drive means is in said second condition so as to treat said treated thread formation.

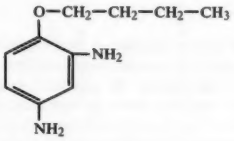
4,323,360

DYEING COMPOSITIONS FOR HAIR WHICH CONTAIN 2,4-DIAMINO-BUTOXYBENZENE AND/OR A SALT THEREOF AS THE COUPLING AGENT

Andree Bugaut, Boulogne, and Alex Junino, Aulnay-sous-Bois, both of France, assignors to L'Oreal, Paris, France

Filed Jun. 16, 1980, Ser. No. 159,920
Claims priority, application France, Jun. 18, 1979, 79 15553
Int. Cl.³ A61K *7/13*
U.S. Cl. 8—407 35 Claims

1. A composition suitable for dyeing human hair in the presence of an oxidizing agent selected from the group consisting of hydrogen peroxide, urea peroxide, alkaline persulfate and alkaline perborate, said composition containing at least one oxidation base and a coupling agent having the formula (I):



(I)

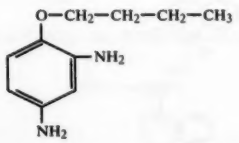
or a salt thereof.

10. A composition according to claim 1, which also contains at least one direct dye

selected from the group consisting of ortho-nitroaniline, 2-amino-3-nitro-isopropylbenzene, 3-nitro-4-amino-phenol, 3-nitro-4-N-β-hydroxyethylamino-phenol, 2-methyl-4-amino-5-nitro-phenol, 2-nitro-4-methyl-6-amino-phenol, 3-nitro-6-N-β-hydroxyethylamino-anisole, 2-amino-3-nitro-phenol, (3-N-methylamino-4-nitro-phenoxy)-ethanol, (2-N-β-hydroxyethylamino-5-nitro-phenoxy)-ethanol, 3-nitro-4-N'-methylamino-N,N-di-β-hydroxyethyl-aniline, 3-nitro-4-N'-β-hydroxyethylamino-N,N-di-β-hydroxyethylaniline and 3-nitro-4-N'-methylamino-N-methyl-N-β-hydroxyethyl-aniline.

17. A composition suitable for dyeing human hair in the presence of at least one oxidizing agent selected from the group consisting of hydrogen peroxide and urea peroxide, comprising an aqueous solution of an effective amount of an oxidation base selected from the group consisting of (a) a paraphenylenediamine, (b) 2,5-diaminopyridine, and (c) a para-aminophenol and 0.005 to 2.5 percent by weight based on the total weight of the composition of, as a coupling agent, 2,4-diamino-butoxybenzene or a salt thereof, said composition having a pH ranging from 8 to 11.5.

35. In a composition for dyeing human hair in the presence of an oxidizing agent wherein said composition contains an oxidation base and a coupling agent, the improvement comprising said coupling agent having the formula



or the hydrochloride, sulfate, citrate or lactate thereof.

4,323,361

DYEING METHOD

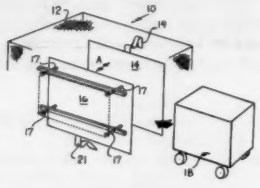
John F. Graham, 2 Cherry Grove, Ilkley, West Yorkshire, and Richard R. D. Holt, 14 Endor Grove, Burley-in-Wharfedale, West Yorkshire, both of England

Filed Mar. 12, 1980, Ser. No. 129,681

Claims priority, application United Kingdom, Mar. 21, 1979, 9984/79

Int. Cl.³ D06P 5/20; G21K 5/08

U.S. Cl. 8—444 **5 Claims**



1. A method of dyeing keratinous fibers which comprises padding the fibers with an aqueous composition containing at least one dyestuff, transferring the padded fibers in a moist state to a thermally insulated batch storage zone in which the fibers are covered with an impermeable layer to prevent loss of moisture, subjecting the thus-stored fibers to radio frequency heating for only a period of time sufficient to raise the temperature of the fibers to between 40° and 80° C. and then discontinuing the heating, and thereafter continuing the batch storage of the moist heated fibers in the thermally insulated zone without further applied heat, to fix the dyestuff in the fibers.

4,323,362

DYED PAPER

Hans-Juergen Degen, Lorsch, and Klaus Grychtol, Bad Duerkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 109,042, Jan. 2, 1980. This application Jan. 14, 1981, Ser. No. 224,943

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901845

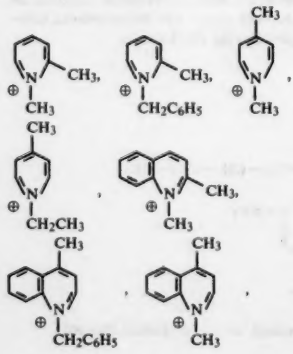
Int. Cl.³ D21H 1/46

U.S. Cl. 8—506 **2 Claims**

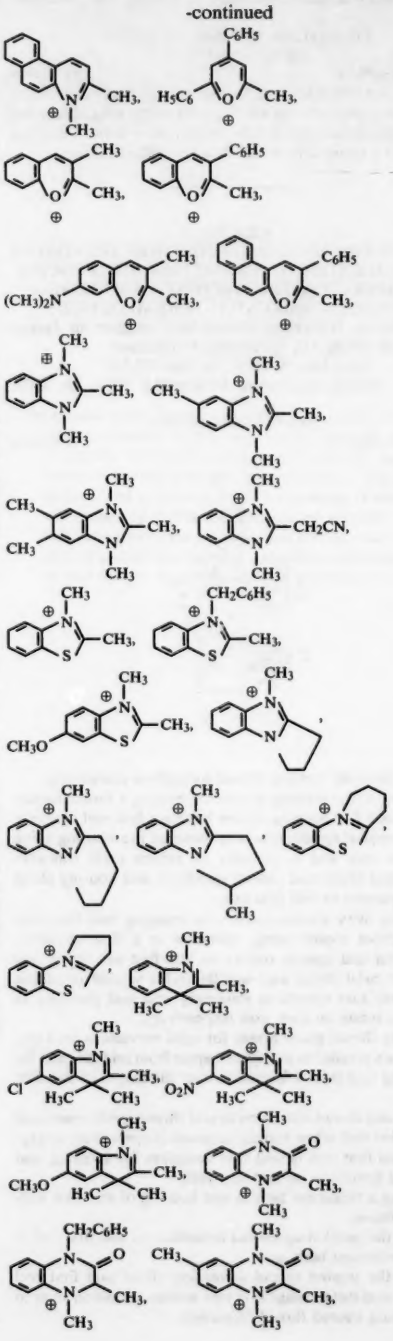
1. Paper stock dyed with a compound of the formula

$$A^1{=}CH{-}B{-}CH{=}A^2$$

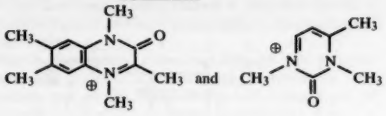
wherein A^1 and A^2 are the same or different radicals derived from quaternized methylene active compounds A^1H_2 and A^2H_2 selected from the group consisting of:



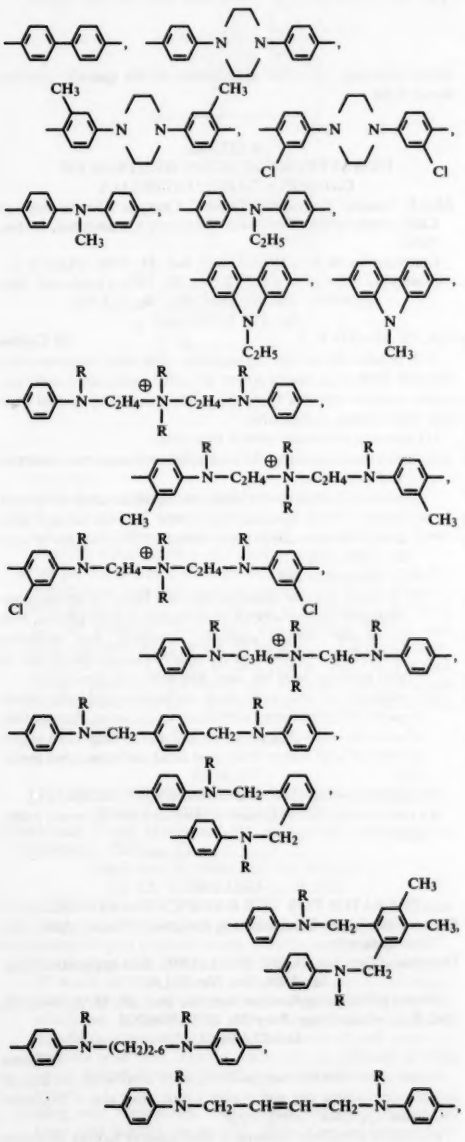
-continued



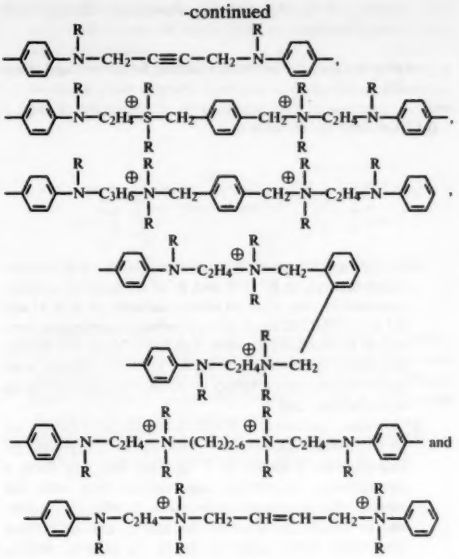
-continued



and wherein B is a bridge member selected from the group consisting of



-continued



where R is C_1–C_4-alkyl, β-hydroxyethyl, β-cyanoethyl or benzyl.

4,323,363

DYEING OF MIXED FIBERS

Gert Brachten; Friedrich Engelhardt; Heinz Helling, all of Frankfurt am Main, and Joachim Ribka, Offenbach am Main-Bürgel, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 940,171, Sep. 7, 1978, abandoned, which is a division of Ser. No. 723,985, Sep. 16, 1976, abandoned. This application May 22, 1980, Ser. No. 152,564

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1975, 2541625; Sep. 20, 1975, 2542051

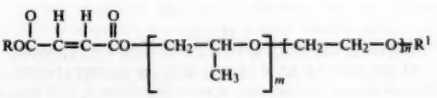
Int. Cl.[3] **D06P** *5/08, 3/82;* **C08F** *222/36*

U.S. Cl. 8—532 **10 Claims**

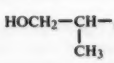
1. In the method of dyeing of polyester fibers with a disperse dye while those fibers are mixed with cellulose fibers, the improvement according to which haze formation is suppressed by applying the disperse dye from a liquor containing in addition to a dispersant about 0.2 to about 5 grams per liter of a normally liquid copolymer of

(a) one mol acrylamide, alpha- or beta-methyl acrylamide, maleamic acid or fumaramic acid, with

(b) from about 0.01 to about 5 mols of



where R is H, NH_4, Na, K, $HOCH_2$—CH_2— or



R^1 is alkyl or alkenyl with up to 20 carbons, alkenyl with from 3 to 20 carbons, phenyl, naphthyl, alkylphenyl

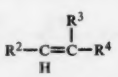
with up to 12 alkyl carbons, alkanoyl or alkenoyl with 4 to 20 carbons;

and

m plus n are whole numbers totalling between 1 and about 30,

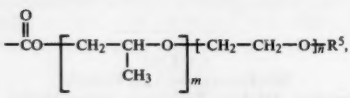
and

(c) from zero to ten mols of



where R^2 and R^3 are both H, or one of them is H and the other methyl, or R^3 is H and R^2 is carboxyl or alkoxycarbonyl having up to 10 alkoxy carbons, or R^2 is H and R^3 is $—CH_2COOH$ or alkoxycarbonyl methylene having up to 10 alkoxy carbons, and any of these R^3 alkoxycarbonyls can be substituted by hydroxy, alkoxy with up to 10 carbons, or mono- or di-alkyl amino having up to 4 carbons; and

R^4 is cyano, carboxyl, $—SO_3H$, sulfo-alkylene having up to 6 carbons, alkanoyloxy with up to 6 carbons, alkanoylamino with up to 7 carbons that can form a pyrrolidone, piperidone, caprolactam ring wth the amino, alkoxycarbonyl with up to 10 alkoxy carbons and in which the alkyl of the alkoxy can be further substituted with hydroxy, up to C_4 alkoxy, amino, mono- or di-alkyl amino having up to 4 carbons or



R^5 being alkyl with up to 20 carbons, alkenyl with from 3 to 20 carbons, phenyl, naphthyl, alkyl-phenyl with up to 12 alkyl carbons, or alkanoyl or alkenoyl with 4 to 20 carbons and 12 alkyl carbons, or alkanoyl or alkenoyl with 4 to 20 carbons and

m and n are whole numbers totalling between 1 and about 30;

the copolymer being miscible with water in all proportions at about 10° C., and in a 4% by weight solution in water giving a viscosity of between about 500 and about 20,000 centipoise at 25° C.

4,323,364

METHOD OF AND APPARATUS FOR EXAMINING SUBSTANCES AND MIXTURES OF SUBSTANCES

Michael Scherz, Nietzschestr. 4, 6800 Mannheim 1, Fed. Rep. of Germany

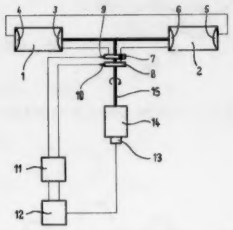
Filed Oct. 15, 1980, Ser. No. 197,325

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1979, 2943942

Int. Cl.³ G01N *27/30, 9/30*

U.S. Cl. 23—230 R **15 Claims**

1. A method of examining substances and mixtures of substances, the method consisting in taking the substance or mixture to be examined in a state in which gravitational orientation of molecules is possible, applying a specific gravitational field to the substance or mixture, and deriving an output signal in accordance with any deflection of the molecular charge orientation resulting from the application of the specific gravitational field.



4,323,365

DEWATERING OF SOLID RESIDUES OF CARBONACEOUS MATERIALS

Alan C. Crosby, Tustin, and David C. Campen, Arcadia, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Continuation of Ser. No. 171,873, Jul. 24, 1980, which is a continuation of Ser. No. 941,772, Sep. 13, 1978, abandoned. This application Jul. 28, 1980, Ser. No. 172,736

Int. Cl.³ C22B *1/14*

U.S. Cl. 23—313 R **34 Claims**

1. A process for producing agglomerated solid carbonaceous material from an aqueous slurry of water and a solid carbonaceous material selected from the group consisting of coal char and coke breeze, comprising:

(a) forming a mixture which comprises

i. said aqueous slurry of said solid carbonaceous material and said water,

ii. an acid, thereby forming an aqueous acid with said water of said aqueous slurry, the amount of said acid being between about 1 and about 35% by weight of said aqueous acid,

iii. a surfactant, and

iv. a liquid organic material selected from the group consisting of hydrocarbons, chlorinated hydrocarbons, low molecular weight aliphatic alcohols, and mixtures thereof, said liquid organic material being immiscible in said aqueous acid but miscible with said surfactant,

the amounts of said acid, said surfactant and said liquid organic material being sufficient to cause agglomeration of said solid carbonaceous material and to displace a major portion of said water from said solid carbonaceous material;

(b) agglomerating said solid carbonaceous material; and

(c) recovering said agglomerated solid carbonaceous material.

4,323,366

APPARATUS FOR THE GASIFICATION OF COAL

Gernot Staudinger, Graz, Austria, assignor to Voest-Alpine AG, Vienna, Austria

Division of Ser. No. 81,083, Oct. 1, 1979. This application Dec. 30, 1980, Ser. No. 221,407

Claims priority, application Austria, Dec. 29, 1978, 9346/78; Fed. Rep. of Germany, May 23, 1979, 2920922

Int. Cl.³ C10J *3/20*

U.S. Cl. 48—73 **7 Claims**

1. An apparatus for the gasification of coal with oxygen or oxygen-containing gas and water vapor, and also if required CO_2, said apparatus comprising:

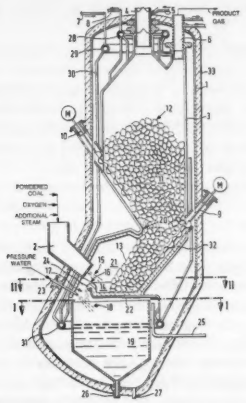
a pressure container forming a shaft gasifier having an upper

coal inlet means for forming a coal bed having a free upper surface and an obliquely extending bottom surface;

said pressure container having therein a chamber having a side portion thereof defined by said bottom free surface of said coal bed;

at least one burner means, extending through said pressure container and into said chamber, for producing at least one primary gas jet and for directing said primary gas jet toward said coal bed in a direction opposite to a direction of flow of an upper free surace of a slag bath, thereby gasifying said coal and generating a product gas and forming liquid slag;

a slag bath tank means for collecting said liquid slag adjacent said bottom free surface of said coal bed, said upper free surface of said slag bath which is collected in said slag



bath tank means partially defining the bottom of said chamber;

a cooling water bath positioned beneath said chamber;

said slag bath tank means having an overflow weir located below said burner means over which said liquid slag flows and falls freely toward said cooling water bath; and

water jet nozzles at a position located below said weir for directing at least one water jet against said liquid slag as it falls freely between said weir and said cooling water bath and for atomizing said liquid slag, thereby cooling said slag and generating steam, at least part of which is supplied as process steam to said coarse coal via a steam outlet means located above said cooling water bath and between said weir and the other side portion of said chamber.

4,323,367

GAS PRODUCTION BY ACCELERATED IN SITU BIOLEACHING OF LANDFILLS

Sambhunath Ghosh, Homewood, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Jun. 23, 1980, Ser. No. 161,922

Int. Cl.[3] **C02F** *11/04;* **C12P** *5/02*

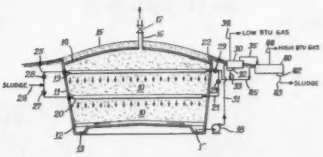
U.S. Cl. 48—197 A **12 Claims**

1. A process for improved gas production by accelerated in situ bioleaching of organic waste landfills comprising:

contacting said organic waste in a substantially sealed landfill in situ with an aqueous activated culture of hydrolytic and liquefying anaerobic microorganisms under growth conditions to produce a bioleachate of hydrolysis and liquefaction products of microbial action of said microorganisms with said organic waste and to produce deactivated hydrolytic and liquefying anaerobic microorganisms;

passing said bioleachate and deactivated microorganisms from said landfill to an acid phase digester operated at mesophilic or thermophilic conditions to regenerate said activated culture of hydrolytic and liquefying anaerobic microorganisms;

passing the supernatant from said acid phase digester to a methane phase digester operated at mesophilic or thermophilic conditions to produce gas rich in methane;



recirculating a mixture of said activated culture of hydrolytic and liquefying anaerobic microorganisms from said acid phase digester and the supernatant from said methane phase digester to contacting organic waste in situ in said substantially sealed landfill; and

withdrawing low Btu gas from said acid phase digester and high Btu gas from said methane phase digester.

4,323,368

GASIFICATION OF COAL

Ogden H. Hammond, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 660,637, Feb. 23, 1976, abandoned, which is a continuation of Ser. No. 506,269, Sep. 16, 1974, abandoned. This application Feb. 8, 1977, Ser. No. 766,931

Int. Cl.[3] **C10J** *3/16;* **C01B** *2/00*

U.S. Cl. 48—202 **11 Claims**

1. A process for forming a low molecular weight hydrocarbon-rich gas from solid carbonaceous particles, metallic iron particles, and steam in a manner to minimize agglomeration of said particles, said process being characterized by the steps of:

(1) cofluidizing the carbonaceous particles with at least about 60 percent by weight metallic iron particles in a gas producing zone, the ratio of the diameter of the iron and carbonaceous material particles being fixed in a relationship to their densities to maintain cofluidization of the particle mixture;

(2) contacting the cofluidized metallic iron and carbonaceous particles with steam at a temperature between about 800° and 1125° K. and a pressure between 1 and 100 atmospheres;

(3) recovering a low molecular weight hydrocarbon-rich gas by removing it from said gas producing zone;

(4) transporting a solid stream rich in FeO produced in said producing zone to a reduction zone;

(5) contacting said solid stream with a gas stream containing carbon monoxide and carbon dioxide, said gas stream having a carbon monoxide to carbon dioxide mole ratio selected to favor the production of iron in the reaction:

$$CO + FeO \rightarrow CO_2 + Fe$$

said gas stream being at a temperature between about 900° and 1300° K. and a pressure between about 1 and 45 atmospheres;

(6) forming a carbon monoxide-rich gas stream from effluent from said reduction zone by removing carbon dioxide from said effluent and recycling the stream to the reduction zone; and

(7) recycling the iron particles produced in step (5) to said producing zone.

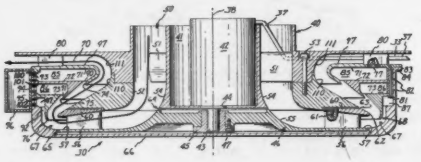
4,323,369
AIR CLEANER AND VENTILATOR

Donald R. Monson, West St. Paul, and Harry R. Camplin, Marine on the St. Croix, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 36,318, May 7, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 178,897

Int. Cl.³ B01D *45/14*

U.S. Cl. 55—1 **14 Claims**



1. Apparatus for removing entrained particulate matter from a gas, comprising:

a circular housing having an annular inlet and circumferential outlet;

an impeller mounted within said housing for rotation about an axis extending centrally through the inlet;

means for driving said impeller;

a plurality of generally radial first vanes secured at circumferentially spaced intervals about said impeller, said first vanes being oriented toward the rotational direction of said impeller;

a plurality of generally radial second vanes secured at circumferentially spaced intervals to said housing about the outlet, said second vanes being oriented against the rotational direction of said impeller;

skimmer means including a plurality of circumferential lips and associated scavenge chambers secured to said housing for defining with said housing and impeller a generally S-shaped cross sectional flow path between the inlet and outlet whereby the particulate matter is centrifugally scavenged before discharge of the gas through the outlet, the lips of said skimmer means extending progressively radially inward between a region adjacent to said impeller and a region immediately upstream of the outlet; and

means connected to said housing for removing the particulate matter from the scavenge chambers of said skimmer means.

4,323,370
ADSORPTION PROCESS PRODUCING VARYING AMOUNTS OF PRODUCT GAS OF A CONSTANT PURITY

Paul Leitgeb, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Jun. 6, 1980, Ser. No. 156,946

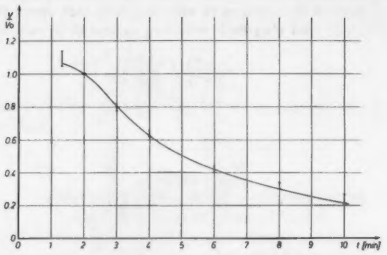
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 2923325

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—18 **12 Claims**

1. In an adsorption process for the fractionation of a gaseous mixture comprised of at least two gaseous components, by an adsorbent which has different kinetic effect adsorption characteristics for each of said at least two gaseous components, the process comprising an adsorption phase wherein the gaseous mixture is passed through an adsorber packed with the adsorbent wherein at least one component of the gaseous mixture is preferentially adsorbed, thereby simultaneously producing a product gas enriched in the remaining components of the gaseous mixture, withdrawing the product gas from the adsorber and subsequently regenerating the adsorber, the improvement comprising adjusting the length of time of operation of the adsorption phase and the rate of flow of said gaseous mixture through the adsorber in response to a fluctuating demand for the product gas.

10. In an adsorption process for the fractionation of a gaseous mixture comprised of at least two gaseous components, wherein an adsorbent is adapted to adsorb each of said at least two gaseous components at different rates through means of the specific kinetic effect between each one of said at least two gaseous components and the specific adsorbent used, the process including an adsorption phase wherein said gaseous mixture is passed through an adsorber packed with said adsorbent whereby at least one gaseous component of said gaseous mixture is preferentially adsorbed, thereby simultaneously producing a product gas enriched in the remaining components of the gaseous mixture, withdrawing product gas from the adsorber and subsequently regenerating the adsorber, the improvement comprising: adjusting the length of time of operation of the adsorption phase in inverse proportion and the rate of flow of said gaseous mixture through the adsorber in direct proportion to a fluctuating demand for the product gas whereby operation of the adsorption phase for different periods of time with corresponding different gaseous mixture flow rates can be accomplished for meeting a specific product gas demand without shutting down the adsorber.



4,323,371
METHOD AND ARRANGEMENT FOR TREATING GASEOUS COMBUSTION PRODUCTS

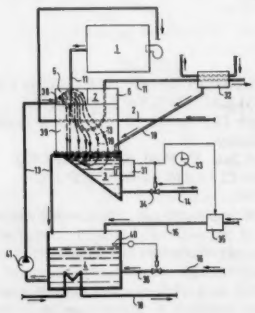
Tapio Ritvanen, Turku, Finland, assignor to Oy Wartsila Ab, Helsinki, Finland

Filed Jun. 10, 1980, Ser. No. 158,300

Claims priority, application Finland, Jun. 15, 1979, 791914

Int. Cl.³ B01D *53/14*

U.S. Cl. 55—19 **11 Claims**



1. A method for operating a plant for treating and scrubbing gaseous combustion products, in particular combustion products containing sulphur dioxide and smoke gases, in which the combustion products are lead to a scrubber unit where they are brought into contact with scrubbing water containing a base,

preferably calcium hydroxide, for neutralization of acids contained in said scrubber unit, whereafter said combustion products are led through a heat exchanger for cooling and recovery of condensation water and the used scrubbing water and said condensation water are collected adjacent to said heat exchanger in a settling tank at the bottom of which solid impurities are caused to settle for removal at suitable intervals, said method including the steps of

measuring the pH value of the mixture in said settling tank for obtaining a measuring value as close as possible to said scrubbing unit,

recycling purified surplus water from said settling tank to said scrubber unit, and

regulating the amount of the base mixed into said scrubbing water so that the pH value of the liquid in said settling tank is kept within the range 7–10, preferably within the range 8–9.

6. An improved apparatus for treating and scrubbing gaseous combustion products from a fuel burning unit, which apparatus comprises a heat exchanger for preheating combustion air, a scrubber unit using scrubbing water and a mixing container for adding a base to said scrubbing water, said scrubber unit being provided with feed nozzles for scrubbing water coming from said mixing container, said nozzles being arranged to bring said scrubbing water into contact with the combustion products in the form of a finely divided mist, the improvement consisting in arranging means for measuring the pH value in a bottom receptacle located below said heat exchanger and arranged to collect said scrubbing water and condensation water separated from said combustion products, said bottom receptacle being positioned adjacent to said heat exchanger, and

arranging said measuring means as close as possible to said scrubber unit to measure the pH value as close as possible to said scrubber unit for governing the preparation of new scrubbing water in said mixing container to which said used scrubbing water is led from said bottom receptacle.

4,323,372

PROCESS FOR RECOVERING NITROBENZENE, DICHLOROBENZENE AND/OR TRICHLOROBENZENE FROM EXHAUST GASES, IN PARTICULAR SPENT AIR

Rolf Bentz, Basel, and Volker Fattinger, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 10, 1980, Ser. No. 214,827

Claims priority, application Switzerland, Dec. 17, 1979, 11160/79

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—59 **11 Claims**

1. A process for recovering nitrobenzene, dichlorobenzene or trichlorobenzene from exhaust gases or spent air, by adsorption on a solid adsorbent, which process comprises passing the substantially undried exhaust gases or spent air containing these compounds through a layer of silica-containing adsorbents, adsorbing said compounds, and subsequently regenerating the adsorbents by removing the sorbed compounds therefrom.

4,323,373

APPARATUS AND METHOD FOR CLEANING AIR

Frederick F. Fritz, Oxford, Mich., assignor to Oxford Air Systems, Inc., Oxford, Mich.

Filed Mar. 23, 1981, Ser. No. 246,329

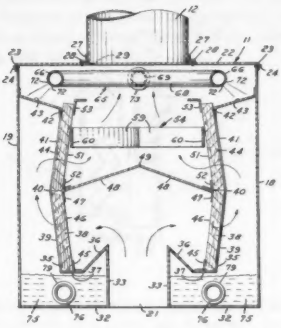
Int. Cl.³ B01D *46/04*

U.S. Cl. 55—96 **14 Claims**

1. A method of removing smoke, grease, odors and other pollutants from air by passing said air through a filter box comprising the steps of:

(a) passing half of the air through one of a first pair of planar filter members, and passing the other half of the air through the other of said first pair of planar filter members;

(b) and then sequentially passing said first half of the air through a first one of a second pair of planar filter members and said other half of the air through the second one of said second pair of planar filter members; and,



(c) continuously cleaning congealed grease and other pollutants from said planar filter member by passing a scrubbing solution sequentially downward by gravity through said second pair of filter members initially, and then through said first pair of planar filter members, and then passing the scrubbing solution and congealed grease and other pollutants cleaned from said planar filters into a reservoir means.

4,323,374

AIR FILTER ASSEMBLY

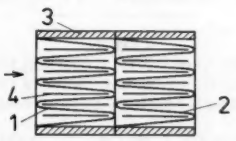
Takehisa Shinagawa, Sakai, and Tsunehiko Inoue, Towdabayashi, both of Japan, assignors to Nitta Belting Co., Ltd., Osaka, Japan

Filed Oct. 19, 1979, Ser. No. 86,449

Claims priority, application Japan, May 4, 1979, 54-54974

Int. Cl.³ B03C *9/02*; B01D *50/00*

U.S. Cl. 55—132 **6 Claims**



1. An air filter assembly comprising:

a frame for supporting filter sheets, said frame having input and output ends;

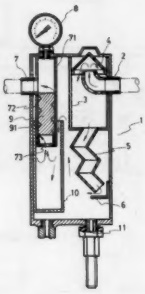
a first filter sheet of HEPA material provided in said frame adjacent to said input end of said frame, said first filter sheet of HEPA material being substantially free of an electrical charge; and

a second filter sheet of material provided in said frame, positioned between said first filter sheet and said output end of said frame, said second filter sheet being made from dielectric material, said second filter sheet further having one surface with a positive charge thereon and another surface with a negative charge thereon.

4,323,375
AIR SEPARATOR FOR AIR COMPRESSOR

Ying-Chung Chang, No. 92, Sec. 2, San Min Rd., Taichung, Taiwan

Filed May 9, 1980, Ser. No. 148,519
Int. Cl.[3] B01D *5/00, 45/00, 50/00, 53/30*
U.S. Cl. 55—270 6 Claims



1. A separator for an air compressor to separate aqueous vapor and oil gas from an air stream comprising:
- a vertically disposed casing having an air intake pipe for receiving air from a compressor and an outlet for discharging the air stream without the aqueous vapor and oil gas;
- a conically converging member mounted adjacent to but spaced from the end of said pipe within said casing;
- a vertically disposed cylindrical protective sleeve surrounding said member and mounted within said casing;
- said air intake pipe extending through said sleeve for directing air to be separated onto said member so that the impingement of air thereon effects separation;
- a zig-zag shaped tube extending from the bottom of said sleeve for conducting air and separated aqueous vapor and oil gas from said sleeve and effecting further separation;
- a plate mounted in said casing so that air leaving said zig-zag shaped tube is directed onto said plate to effect further separation, the separated liquid thereafter accumulating in the bottom of said casing;
- a transparent pipe connected to the interior of said casing and extending outside thereof for indicating the level of liquid in said casing; and
- a round pipe mounted adjacent said outlet and above the bottom of said casing has an open end so as to direct air leaving said zig-zag shaped tube to said outlet.

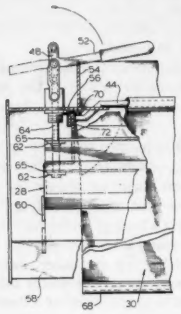
4,323,376
DUST COLLECTOR WITH QUICK RELEASE FILTER SUPPORT SYSTEM FOR USE IN DUST COLLECTORS

Arthur P. Rosenquest, 2302 N. Pine Ave., Arlington Heights, Ill. 60004

Filed Sep. 2, 1980, Ser. No. 182,945
Int. Cl.[3] B01D *46/04*
U.S. Cl. 55—304 20 Claims

1. A bag filter apparatus which comprises a casing, an open center bulkhead having top and bottom faces and dividing the casing into upper and lower compartments, a bag filter unit having a peripheral frame suspending filter bags, quick release clamping means mounted on said bulkhead having activating means positioned above said top face of said bulkhead and clamping said frame to said bottom face of said bulkhead, a dust collecting hopper communicating with said lower compartment, an exhaust blower communicating with said upper compartment, an air outlet communicating with said upper compartment, an air inlet communicating with said lower compartment, said blower pulling an air stream through the bag filters from said lower to said upper compartments and exhausting filtered air from said upper compartment of said casing through said air outlet to the surrounding atmosphere and a door positioned and arranged on said casing to provide access to said bulkhead for insertion and removal of said bag filter unit.

18. Dust collecting apparatus which comprises a casing, a peripheral bulkhead in said casing, a bag filter tray assembly suspended from said bulkhead dividing the casing into upper and lower compartments, an air inlet communicating with said

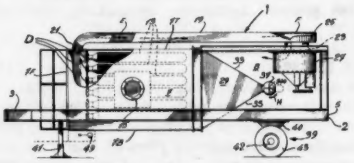


lower compartment, an air outlet positioned in said upper compartment, a filter cloth suspended from said tray, clamps having actuating means positioned above said bulkhead so as to releasably secure the tray to the bulkhead in sealed relation therewith whereby the filter tray and cloth separate the casing into said upper and lower compartments and means for exhausting air through the casing to filter solids from the air on the surfaces of the filter cloth and a door positioned and arranged on said casing to provide access to said bulkhead for insertion and removal of said bag filter tray assembly.

4,323,377
MOBILE DUST COLLECTOR

Marcel Jolin, Dollard des Ormeaux, Canada, assignor to Dustell LTEE, Lachine, Canada

Filed Nov. 3, 1980, Ser. No. 203,706
Int. Cl.[3] B02C *23/10;* B01D *46/02*
U.S. Cl. 55—341 HM 20 Claims



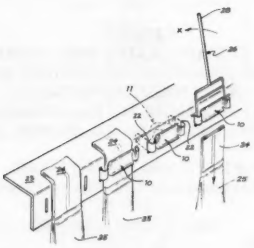
1. A mobile dust collector, comprising:
trailer means having;
- a housing structure mounted on said trailer means, said housing structure including:
  - (i) a filter chamber and a fan chamber;
  - (ii) means communicating outside air with said filter chamber;
  - (iii) filter means disposed in said filter chamber;
  - (iv) fan means disposed in said fan chamber; and
  - (v) means communicating the interior of said filter chamber with said fan means; and
- means for swivelling the housing structure from a substantially horizontal position to an upright position, said means comprising:
- a first telescoping member connected on one side of said housing structure;

a second telescoping member connected on the other side of said housing structure;
a first vertically extending frame member on one side of said housing structure;
a second vertically extending frame member on the other side of said housing structure;
a first horizontally extending frame member on one side of said trailer means;
a second horizontally extending frame member on the other side of said trailer means;
said housing structure being pivotally connected, at either side thereof, to said vertically extending frame members;
the top of each telescoping member being connected to said housing structure at respective sides thereof; and
the bottom of each telescoping member being connected to a respective one of said horizontally extending frame members; and
wheel means at the back end of said trailer means to rollingly support said trailer means.

4,323,378
CLAMPING MEANS

Rodney W. Miljoen, Berowra Waters, Australia, assignor to James Howden Australia Pty. Limited, Australia

Filed Aug. 27, 1980, Ser. No. 181,703
Claims priority, application Australia, Aug. 27, 1979, PE0215
Int. Cl.³ B01D *46/02;* A44B *21/00*
U.S. Cl. 55—378 **5 Claims**



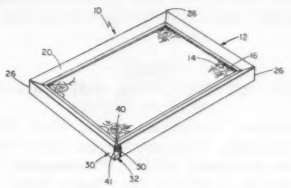
1. Clamping means for clamping an end of a fabric filter bag to a supporting frame member having apertures, comprising a substantially U-shaped clamping member, the bight portion of which forms a clamping portion adapted to lie on one side of the frame member while the arms of the clamping member project through the apertures in the frame member, and a leaf spring constructed such that it is adapted to engage with the arms of the clamping member and to bear against the other side of the said frame member such that the clamping portion of the clamping member is urged towards the one side of the frame member.

4,323,379
AIR FILTER PANEL

Robert W. Shearin, Henderson, N.C., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Nov. 28, 1980, Ser. No. 211,460
Int. Cl.³ B01D *46/10*
U.S. Cl. 55—511 **10 Claims**

1. In an air filter panel of the type having a fibrous filter batt and a circumferential support frame surrounding the batt, the frame having an axially extending frame element, the frame element being folded transversely to form frame sidewalls, the side of the batt being connected to the sidewalls of the frame, the ends of the folded frame element being fastened together to secure the batt in place within the surrounding sidewalls, the improvement comprising an improved frame end fastening means, said means comprising:
a tab connected at a fixed end thereof to the sidewall of the support frame adjacent one end of the frame element,
said tab having a neck portion at said fixed end and a head portion adjacent a free end thereof,
said head portion being connected along a portion of a following edge thereof to said neck portion, the remaining unconnected portion of the following edge providing a flange portion of said following edge, and
a slot in the sidewall adjacent the end of the frame element opposing said tabbed end,

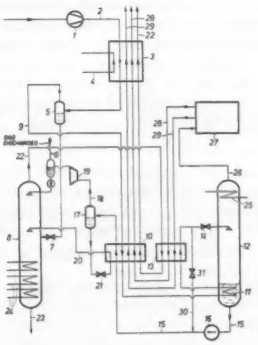


said slot being at least as wide as the maximum width of said head of said tab to receive said head in a single sliding movement without bending of said head,
said head being fully inserted in said slot, said slot having a free edge facing and parallel to said following edge, thereby producing line contact between said free edge and said following edge opposing withdrawal of said head from said slot.

4,323,380
RECTIFICATION OF GASEOUS MIXTURES

Karl-Heinz Müller, Geretsried, and Wolfgang Förg, Icking, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 6, 1980, Ser. No. 175,817
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932561
Int. Cl.³ F25J *3/06*
U.S. Cl. 62—28 **9 Claims**



1. In a process for the separation of nitrogen and ethane from a natural gas mixture containing nitrogen and ethane, wherein a fraction containing all the nitrogen, and a fraction containing substantially all the ethane, are separated from the natural gas by rectifying under superatmospheric pressure, the natural gas being fractionated in a first rectifying column into a head product substantially freed of at least the ethane, and containing methane and nitrogen, and into a bottoms product containing methane and substantially all of the ethane from the natural gas, and substantially freed of nitrogen, the improvement comprising the steps of:

compressing the liquids bottom product of the first rectifying column;

passing the resultant compressed bottoms product through an indirect heat exchange with the natural gas for heating the compressed bottoms product;

expanding the resultant heated compressed bottoms product and passing it into a second rectifying column;

fractionating the expanded bottoms product in said second rectifying column to form a top product containing methane and a sump product containing ethane; and

passing the head product from the first rectifying column to a separation unit for separating nitrogen from methane.

4,323,381

METHOD FOR PRODUCING MOTHER RODS FOR OPTICAL FIBERS

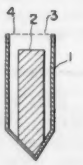
Iwao Matsuyama, Sagamihara; Kenzo Susa, Hinodemachi; Tsuneo Suganuma, Tokorozawa; Shin Satoh, Iruma; Toshio Katsuyama, Kokubunji, and Hidehito Obayashi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 113,340, Jan. 18, 1980, abandoned. This application Jul. 17, 1980, Ser. No. 169,638

Claims priority, application Japan, Jan. 19, 1979, 54/3957

Int. Cl.³ C03B *5/16*

U.S. Cl. 65—32 **56 Claims**



1. A process for producing a mother rod useful in the production of an optical fiber which consists essentially of:

(i) forming a gel in a predetermined shape in a container means which is similar to the shape of the desired glass block to be produced from a mixed solution comprising a silicon alkoxide having the formula $Si(OR)_4$ wherein R is an alkyl group, water and a polar organic solvent,

(ii) drying the resulting gel to form a dry gel, and

(iii) sintering the dry gel at its collapse temperature but lower than the melting temperature of the dry gel, thereby forming a glass block of the desired shape.

4,323,382

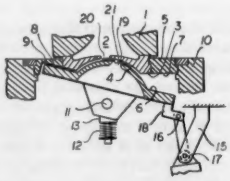
METHOD OF PRESSING GLASS ARTICLES, ESPECIALLY FEET OF GLASSES WITH INTEGRALLY FORMED STEMS

Herman Fuller, Riedlhutte, Austria, assignor to Dorma Glas GmbH & Co. KG, Salzburg, Austria

Filed Mar. 27, 1980, Ser. No. 134,663

Int. Cl.³ C03B *11/08*

U.S. Cl. 65—70 **9 Claims**



1. A method of pressing glass articles from a glass parison to form feet of glasses with integrally formed stems; said method comprising:

pressing substantially all of the glass parison into a mold having the internal contour of the glass article to be formed with a portion of the parison being left behind outside of the mold, the glass article is subsequently separated from the remaining part of the parison; cutting off the still plastified connecting protrusion between the remaining part of the parison and the glass article following the pressing operation; and, removing the protrusion left on the glass article and in the mold bottom by forming the same into the foot.

4. In an apparatus for pressing a foot of a glass with an integral stem from a parison of glass, said method comprising:

a mold having a mold bottom defining and shaping an outer surface of the foot and being provided with an aperture of a predetermined size for pressing the glass into said mold; an outer side of said mold bottom being spherically recessed; a cutting portion with a complementarily spherical surface, said cutting portion having an aperture of similar diameter adapted to be aligned with the aperture of said mold bottom to allow for the passage of the glass therethrough, means for moving said cutting portion to perform an angular movement which permits a point on the circumference to be displaced by a distance exceeding the diameter or width of said aperture of said mold bottom to sever that portion of the glass outside of the mold from a protrusion of glass remaining in the aperture in said mold bottom.

4,323,383

METHOD AND APPARATUS FOR UNIFORMLY HEATING A GLASS STREAM WITHIN THE FEEDER OF A GLASS MELTING FURNACE

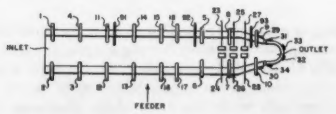
George R. Sims, Lohr am Main, Fed. Rep. of Germany, assignor to Nikolaus Sorg GmbH & Co. KG, Postfach, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,618

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935416

Int. Cl.³ C03B *5/027*

U.S. Cl. 65—135 **7 Claims**



1. In a method for uniformly heating a glass stream flowing from the inlet to the outlet of a feeder of a glass melting furnace, wherein power or energy is supplied through electrodes immersed in the glass melt, and wherein the temperature of the glass stream is continuously detected, the improvement comprising the steps of: maintaining the current flowing between cooperating electrodes constant independently of the resistance of the glass melt, by controlling the voltage as long as the temperature of the glass stream does not deviate by a predetermined amount from a set value, regulating the current flow of at least a number of electrodes positioned at the inlet of the feeder to compensate for temperature variations, when the tolerable deviation limit has been exceeded and introducing electric current into the refractory material of the feeder to flow therein at least in front or upstream of the outlet of the feeder and at said outlet.

4. In a system for uniformly heating a glass stream flowing from the inlet to the outlet of a feeder of a glass melting furnace of the type wherein energy is supplied through electrodes immersed in the glass melt and means continuously detect the temperature of the glass stream, the improvement comprising: means independent of the glass melt resistance for maintaining

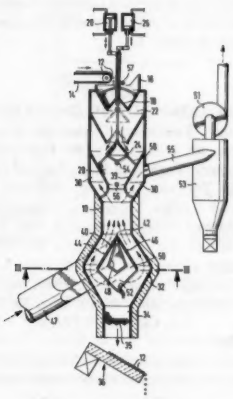
a constant current flow between coacting electrodes including means for controlling the voltage when the temperature of the glass stream varies within predetermined limits; and means for adjusting the value of the constant current flow of at least a plurality of electrodes at the inlet of the feeder when the temperature of the glass stream exceeds said limits to compensate for the temperature change; and wherein a plurality of contacts are arranged in pairs at least upstream of the outlet and at said outlet, the contacts being in contact with the refractory material of the feeder and connected to the maintaining means.

4,323,384

PREHEATER FOR COMPACTED VITRIFIABLE MATERIAL

Georges Meunier, Boulogne, France, assignor to Isover Saint-Gobain, Neuilly sur Seine, France

Filed Jul. 25, 1980, Ser. No. 172,232
Claims priority, application France, Jul. 27, 1979, 79 19445
Int. Cl.³ C03B *3/00*
U.S. Cl. 65—335 **10 Claims**



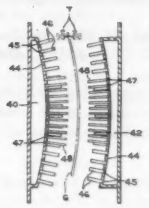
1. A preheater for preheating massed-together, vitrifiable material which may be in the form of balls prior to introduction into a glass-smelting furnace, said preheater comprising a column having a flow path within the region of a heat-insulated wall between an inlet and an outlet, said column arranged substantially in a vertical plane and said material being loaded into said column through the inlet at the top thereby to fall by the force of gravity substantially in counter-flow to the flow of hot gases coming from the furnace circulating upward under action of a fan disposed within the upper region of the column whose low pressure side is in communication with said flow path, characterized in that the flow path of the column substantially constant in cross section includes a central chamber with an enlarged section, a dihedral element having an edge, means for mounting said dihedral element so that said edge is arranged horizontally, in a vertical plane of symmetry of the column and rotated toward the inlet at the top of the column whereby said dihedral element, the wall of the column and a sloping alignment of balls which forms under said dihedral element defines a mixing chamber, said mixing chamber connected with a regenerator for the hot gases from the glass-furnace, and adjustable closing means at said outlet of said column.

4,323,385

NOZZLE ARRANGEMENT FOR GLASS SHEET TEMPERING APPARATUS

Dean W. Gintert, Evansville, Ind., and Raymond A. Waksmunski, Tyrone, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1980, Ser. No. 170,470
Int. Cl.³ C03B *27/04*
U.S. Cl. 65—351 **7 Claims**



1. An apparatus for tempering a glass sheet by blasting cool tempering medium against opposed major surfaces of a heated glass sheet, comprising:

first means for directing streams of tempering medium;

second means for directing streams of tempering medium;

means for mounting said first and second directing means in facing relationship to direct their respective streams of tempering medium through a common tempering position; and

each of said first and second directing means includes a plurality of discrete spaced orifices each having a cross-sectional area with the cross-sectional area of the innermost orifices facing central portion of the common tempering position having a higher orifice density than the orifice density facing portions outside the central portion of the common tempering position and the cross-sectional area of the innermost orifices being smaller than the cross-sectional area of the outermost orifices with orifices adjacent one another in a direction from the outermost orifice to the innermost orifice being approximately equal in cross-sectional area or having a smaller cross-sectional area to facilitate escape of spent tempering medium from the central portion of the common tempering position.

4,323,386

METHOD OF MANUFACTURING NP- OR NPK-CONTAINING FERTILIZERS FROM MAGNESIUM CONTAINING PHOSPHATE

Trygve Heggebo, Porsgrunn, and Arne Conradsen, Heistad, both of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Continuation of Ser. No. 50,217, Jun. 20, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 227,973
Int. Cl.³ C05B *7/00*
U.S. Cl. 71—35 **6 Claims**

1. In a method of manufacturing NP- or NPK-containing fertilizer from phosphate ore having a magnesium content of more than 0.3 percent by weight, which comprises subjecting said ore to digestion with nitric acid, removing calcium, as calcium nitrate-tetrahydrate, from the digestion mixture by means of crystallization and filtration until the filtrate resulting from said filtration has a Ca/P-ratio of about 0.35, subjecting said filtrate to neutralization with ammonia, directly subjecting the neutralized filtrate to evaporation, and prilling or granulating the product resulting from said evaporation, the improvement wherein the method is carried out without causing viscosity problems related to the high magnesium content in the ore, by (1) reducing the Ca/P-ratio in said filtrate resulting from said filtration from about 0.35 to 0.01–0.15 by adding sulphuric acid or a sulphate to said filtrate to precipitate calcium in said filtrate, as calcium sulphate, and removing said

calcium sulphate from the resultant mixture, and (2) subjecting said filtrate having a Ca/P-ratio of 0.01–0.15 to said neutralization with ammonia until said filtrate has an N/P_2O_5- ratio of 0.5–2.

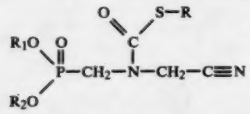
4,323,387

N-THIOLCARBONYL DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINONITRILE ESTERS, HERBICIDAL COMPOSITIONS AND USE THEREOF

Gerard A. Dutra, Ladue, Mo., assignor to Monsanto Company, St. Louis, Mo.

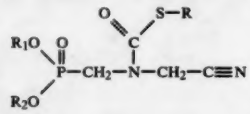
Filed Jul. 28, 1980, Ser. No. 172,883
Int. Cl.³ C07C *155/02*; A01N *57/18*
U.S. Cl. 71—87 **15 Claims**

1. A method of controlling undesired plants which comprises contacting said plants or the plant growth medium with a herbicidal amount of a compound of the formula



wherein R is selected from the group consisting of lower alkyl, lower cycloalkyl, lower alkenyl, phenyl, benzyl and halobenzyl and R_1 and R_2 are independently selected from the group consisting of phenyl and substituted phenyl containing from one to three substituents independently selected from the class consisting of lower alkyl, lower alkoxy and halogen.

6. A compound of the formula



wherein R is selected from the group consisting of lower alkyl, lower cycloalkyl, lower alkenyl, phenyl, benzyl and halobenzyl and R_1 and R_2 are independently selected from the group consisting of phenyl and substituted phenyl containing from one to three substituents independently selected from the class consisting of lower alkyl, lower alkoxy and halogen.

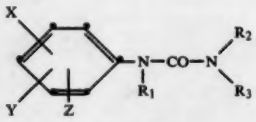
4,323,388

CYANOALKYL-PHENYLUREAS HAVING SELECTIVE HERBICIDAL ACTIVITY

Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Dieter Dürr, Bottmingen; Otto Rohr, Therwil, and Alfons Lukaszczyk, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 3, 1981, Ser. No. 240,336
Claims priority, application Switzerland, Mar. 10, 1980, 1860/80
Int. Cl.³ A01N *47/30, 47/38*; C07C *127/19*; C07D *295/16*
U.S. Cl. 71—88 **23 Claims**

1. A cyanoalkyl-phenylurea of the formula I

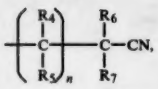


(I)

wherein

X is hydrogen, halogen, trifluoromethyl, methyl or methoxy,

Y is

a cyanoalkyl group 

Z is hydrogen or halogen,

n is the number 0, 1 or 2,

R_1 is hydrogen or C_1–C_6-alkyl,

R_2 is hydrogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_2–C_6-alkenyl or C_3–C_6-alkynyl,

R_3 is hydrogen, C_1–C_6-alkyl or C_2–C_6-alkenyl, or

R_2 and R_3 together with the nitrogen atom to which they are bound form a 5–7-membered heterocycle, which can contain as ring member also an oxygen or sulfur atom or an imino group,

R_4, R_5 and R_6 are each hydrogen, C_1–C_6-alkyl and C_1–C_6-haloalkyl,

R_7 is hydrogen, C_1–C_6-alkyl, aralkyl, particularly benzyl, phenyl or C_1–C_6-alkoxy, or

R_6 and R_7 together with the carbon atom carrying them can form a C_3–C_7-cycloalkyl ring.

21. A method for selectively combating weeds in crops of cultivated plants, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim **1**.

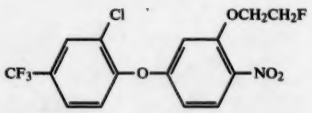
4,323,389

HERBICIDAL COMPOUNDS AND COMPOSITIONS

Takeo Yoshimoto, Yokohama; Takayuki Inoue; Hideo Michiyama, both of Omuta; Takeo Harayama, Kamakura; Osamu Morikama; Yoshikata Hojo, both of Chigasaki; Takao Baba, Omuta; Teruhiko Toyama, Fujisawa; Masaaki Ura, Yokohama, and Yoshio Takasawa, Chigasaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 734,198, Oct. 20, 1976, abandoned, which is a division of Ser. No. 638,109, Dec. 5, 1975, Pat. No. 4,264,777. This application Jul. 8, 1980, Ser. No. 167,154
Claims priority, application Japan, Dec. 23, 1974, 49-146789
Int. Cl.³ A01N *31/14*
U.S. Cl. 71—124 **8 Claims**

1. A herbicidal composition which comprises a herbicidally effective amount of a diphenyl ether compound of the formula:



and an inert carrier or vehicle.

4,323,390

PROCESS FOR CONVERTING BRASS SCRAP TO COPPER POWDER

Paul R. Kruesi, Golden, and Veryl H. Frahm, Jr., Boulder, both of Colo., assignors to Southern Foundry Supply Company, Chattanooga, Tenn.

Filed Dec. 20, 1979, Ser. No. 105,614
Int. Cl.³ B22F *9/00*
U.S. Cl. 75—0.5 A **24 Claims**

1. A process for the production of copper powder from brass, wherein the brass does not contain silicon, greater than about 5 percent tin, or greater than about 5 percent nickel, comprising:

(a) reacting the brass with hydrochloric acid in an oxygen-

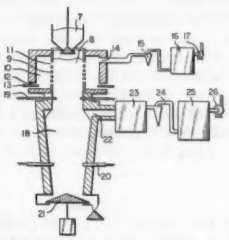
free atmosphere at a temperature of at least 70° C. until the non-copper metals and impurities contained in the brass are dissolved;
(b) oxidizing at least 10 percent by weight of the copper from step (a) to copper oxides;
(c) grinding the copper of step (b) to a powder; and
(d) removing the copper oxides contained in the powder of step (c) to obtain copper powder.

4,323,391

PROCESS FOR RECOVERING ZINC

Tsuneo Honda; Haruo Nishina, and Shuichi Uehara, all of Annaka, Japan, assignors to Toho Aen Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 915,672, Jun. 15, 1978, abandoned, and a continuation of Ser. No. 794,366, May 6, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,990
Claims priority, application Japan, May 20, 1976, 51-57256
Int. Cl.³ C22B *4/02*
U.S. Cl. 75—14 **16 Claims**



1. A process for recovering zinc or zinc oxide from zinc containing materials with the use of a shaft type electrothermically distilling furnace, which comprises:
(a) mixing a bituminous material with a zinc-containing material;
(b) forming briquettes from the mixed material;
(c) dry distilling the bituminous material containing briquettes to convert them into coked lumps;
(d) electrothermically distilling the bitumin containing coked lumps to obtain zinc vapor; and
(e) recovering zinc from said vapor.

4,323,392

AGENT FOR DESULFURIZING CRUDE IRON AND STEEL MELTS, AND PROCESS FOR MAKING IT

Albert Braun; Willi Portz, and Georg Strauss, all of Hoechst Aktiengesellschaft, Werk Knapsack, Hürth-Knapsack, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,565
Claims priority, application Fed. Rep. of Germany, May 14, 1979, 2919324
Int. Cl.³ C21C *7/02*
U.S. Cl. 75—58 **6 Claims**

1. An agent for desulfurizing crude iron and steel melts, the desulfurizing agent consisting of calcium carbide and calcium oxide and being produced by the steps comprising: preparing a calcium carbide melt containing up to 45 weight % of calcium oxide; introducing into the melt fine particulate calcium oxide in a total amount of more than 48 up to 95 weight % of the final product; allowing the resulting molten mixture to solidify and cool down to a temperature of 350° to 450° C.; precrushing the solidified melt at that temperature to material with a size of less than 150 mm; screening off particles with a size of less than 4 mm; and further crushing and grinding the remaining material, with the exclusion of moisture, to material with a size of less than 10 mm.

4,323,393

HOT DIPPING LEAD BASE COATING MATERIAL

Teiji Nagahōri, No. 15-24 Nakaaoki 2-chome, Kawaguchi-shi, Saitama-ken, and Masanori Ohshima, No. 1043 Amanuma-cho 2-chome, Ohmiya-shi, Saitama-ken, both of Japan

Continuation-in-part of Ser. No. 39,579, May 16, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 179,478
Claims priority, application Japan, Jun. 9, 1978, 53-068922
Int. Cl.³ C23B *5/14, 5/38, 5/40*
U.S. Cl. 75—166 C **12 Claims**

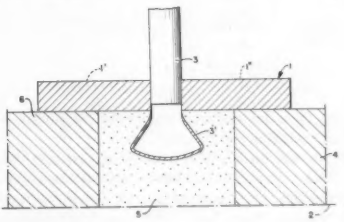
1. A hot dipping lead base coating material which consists of from 0.3 to 4.9 percent by weight of tin, from 0.001 to 0.3 percent by weight in phosphorus content equivalent of at least one selected from the group consisting of phosphorus, tin phosphide, zinc phosphide, antimony phosphide, bismuth phosphide and lead phosphide, and the balance of lead and inevitable impurities.

4,323,394

METHOD FOR MANUFACTURING TURBOROTORS SUCH AS GAS TURBINE ROTOR WHEELS, AND WHEEL PRODUCED THEREBY

Wilhelm Hoffmüller, Munich; Axel Rossmann, Karlsfeld, and Franz Schreiber, Meitingen-Herbertshofen, all of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 63,714
Int. Cl.³ B22F *5/00, 7/00*
U.S. Cl. 75—208 R **19 Claims**



1. Method for manufacturing turborotors, such as gas turbine wheels, comprising the steps of (1) inserting a root portion of turbine blades within a cavernous recess area of a pre-manufactured rotor disk with the root portion spaced from wall portions of said disk defining the recess area; (2) inserting a powdered connection material between said root portion and wall portions; and (3) sintering said connection material for joining said root portion of the blades to the rotor disk.

5. Method for manufacturing turborotors, such as gas turbine wheels, comprising the step of joining a common root portion of a pre-manufactured cast blade ring having a row of blades within a rotor disk by sintering a connection material about the root portion, wherein the blades are ceramic or silicon ceramic blades and comprising the step of coating the blade root portion with a ductile material before they are sintered in place in the rotor disk by said connection material, whereby widely differing thermal expansions between the blade material and said connection material are balanced.

4,323,395

POWDER METALLURGY PROCESS AND PRODUCT

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Filed May 8, 1980, Ser. No. 147,711
Int. Cl.³ B22F *1/00, 3/00*
U.S. Cl. 75—212 **18 Claims**

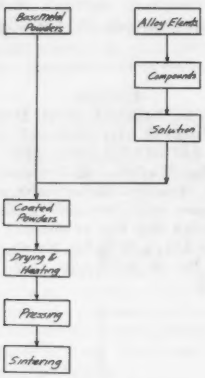
1. A method for making a powder metallurgy product having a multi-component alloy system of a given composition comprising:

collecting powder particles containing a selected component;

forming on the surface of the powder particles a coating containing the other component to a thickness calculated to provide the given composition in the finished product, the specific gravity of the selected component differing from that of the other component by at least a factor of two;

pressing said collected and coated particles to form a powder compact; and sintering the powder compact.

7. A method for making a powder metallurgy product having a multi-component system of a given composition comprising:



collecting powder particles consisting essentially of a selected, yieldable component;

forming on the surface of the particles a coating containing the other component and having a thickness calculated to provide the given composition in the finished product, said coating being fracturable and fragmentable under deformation;

pressing said collected and coated particles, during said pressing step said particles yielding and deforming under the compacting pressure while, simultaneously, said coating fracturing and fragmenting into pieces to fill the nearby voids between said pressed particles thereby enhancing the packing density of the powder compact;

and sintering the pressed powder compact.

4,323,396

PROCESS FOR THE PREPARATION OF PIGMENT FORMULATIONS AND THEIR USE

Klaus Ehl, Frankfurt am Main, and Reinhold Deubel, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,779

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, 3004442

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—23 **12 Claims**

1. A process for the manufacture of pigment preparations which comprises contacting an organic pigment with a polysaccharide having anionic groups and an affinity to said pigment in an aqueous medium, separating mechanically the contacted pigment and drying it.

4,323,397

METHOD AND APPARATUS FOR THE THERMAL TREATMENT OF FINE-GRAINED MATERIAL WITH HOT GASES

Horst Herchenbach, Troisdorf; Hubert Ramesohl, and Kunibert Brachthäuser, both of Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Division of Ser. No. 26,610, Apr. 3, 1979. This application Mar. 10, 1981, Ser. No. 242,396

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1978, 2815461

Int. Cl.³ C04B *7/36*

U.S. Cl. 106—100 **7 Claims**

1. In a method for the thermal treatment of finely divided material for the calcination of cement in a process in which:

said material is preheated in a heat exchanger and later passed to a calcining furnace,

said material is partially deacidified in a pre-calcination zone before entering said calcining furnace, the further calcining and sintering of the material being completed in said calcining furnace,

in which rapidly oxidizing fuel components are burned in said pre-calcination zone in a first stage and more slowly oxidizing fuel components are combined with the partly calcined material from said first stage in a second stage and then sintered, the improvement which comprises:

utilizing as said more slowly oxidizing fuel a mixture of granulated fuel of substantially uniform size and larger particles of briquetted or coarsely broken fuel.

4,323,398

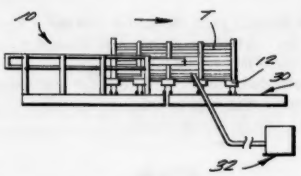
PERFORMING MAINTENANCE OPERATIONS ON HEAT EXCHANGER TUBE BUNDLES

Andrew Simon, Roadmeetings, Carluke, ML84QQ Lanarkshire, Scotland

Filed Apr. 7, 1980, Ser. No. 137,965

Int. Cl.³ B08B *7/04*

U.S. Cl. 134—18 **14 Claims**



1. A method for performing maintenance operations on a heat exchanger tube bundle mounted in a heat exchanger shell utilizing an extracting and inserting apparatus including a frame structure having a plurality of movable trollies supported for movement therewith and for supporting the tube bundle at spaced points along the length thereof, the trollies having rollers disposed on opposite sides of the central axis of the tube bundle, the method comprising the steps of

(a) linearly moving the tube bundle to pull it out of the heat exchanger shell onto the frame structure;

(b) providing the trollies beneath the tube bundle at predetermined spaced points along the length thereof and in engagement therewith to support the weight of the tube bundle;

(c) moving the frame structure with supported tube bundle to a supported position wherein the central axis of the tube bundle is substantially horizontal;

(d) rolling the trollies, with supported tube bundle, off of the frame structure by moving the tube bundle horizontally with the trolley rollers rolling along a stationary horizontal support;

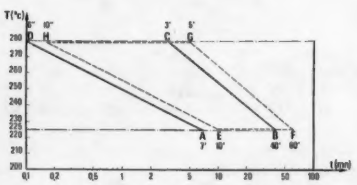
(e) moving the tube bundle, while still supported by the trollies, to desired maintenance stations at which maintenance operations are performed on the tube bundle while still supported by the trollies;
(f) rolling the trollies supporting the tube bundle back onto the frame structure while the frame structure is in a horizontal position;
(g) moving the frame structure into operative association with the heat exchanger shell; and
(h) linearly moving the tube bundle off of the frame structure into the heat exchanger shell.

4,323,399

PROCESS FOR THE THERMAL TREATMENT OF ALUMINIUM - COPPER - MAGNESIUM - SILICON ALLOYS

Bruno Dubost, and Jean Bouvaist, both of Grenoble, France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Aug. 23, 1979, Ser. No. 69,088
Claims priority, application France, Sep. 8, 1978, 78 26371
Int. Cl.³ C22F *1/04*
U.S. Cl. 148—12.7 A **20 Claims**



1. A process for the thermal treatment of wrought products made of aluminum-base high silicon alloy of the 2000 series consisting essentially of by weight, from about 3.5 to 5% of copper, from about 0.2 to 1% magnesium, from about 0.5 to 1.2% silicon, a Si to Mg ratio > 1.0 and from about 0 to 1% manganese, from about 0 to 0.5% chromium and from about 0 to 0.3% zirconium, said treatment consisting of the essential sequential steps of solution heat treatment, quenching, ageing at ambient temperature and tempering, wherein said tempering comprises at least two sequential stages:
(a) the first stage being a main tempering treatment at a temperature higher than about 225° C. and lower than about 280° C. for a period of between about 6 seconds and about 60 minutes; and
(b) the second stage being a complementary tempering treatment at a temperature between about 120° C. and about 175° C. for a period of between about 4 and about 192 hours.

3. A process according to claim 1 in which the products are cold worked by plastic deformation of from about 1 to about 5% after the quenching treatment step, wherein the point which is representative of the main tempering treatment step in a temperature/time graph is situated in a quadrangle ABCD, of FIG. 1 having as approximate coordinates:

A = 225° - 7 mn	B = 225° - 40 mn
D = 280° - 6 s	C = 280° - 3 mn

4,323,400

ARTICLES HAVING AN INSULATIVE COATING CONTAINING KAOLIN AND STAPLE FIBERS

William J. Henning, 220 Forest Ave., Cincinnati, Ohio 45215

Division of Ser. No. 35,462, May 3, 1979, Pat. No. 4,240,936.
This application Jul. 30, 1980, Ser. No. 173,465
Int. Cl.³ B32B *23/00*; C08L *1/28*
U.S. Cl. 428—36 **10 Claims**

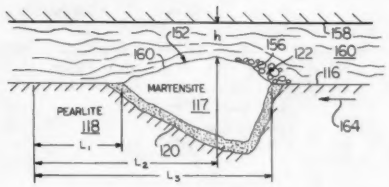
1. An article comprising a substrate coated with an insulative aqueous composition containing film-forming solids consisting essentially of kaolin particles in an amount on the order of about 30% to about 90% by weight, staple fibers and a dispersing agent for said solids in the aqueous composition, said kaolin particles having a diameter of less than about 50 microns.

4,323,401

BEARING HAVING AN ARRAY OF MICROASPERITIES

William H. Belke; Joseph C. Hafele; Ernest W. Landen, and Thomas J. Richards, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 632,602, Nov. 17, 1975, Pat. No. 4,047,984.
This application May 13, 1977, Ser. No. 796,586
Int. Cl.³ B32B *15/18*; F16C *33/00*
U.S. Cl. 148—39 **6 Claims**



1. A bearing, comprising:
(a) a generally planar surface; and
(b) an array of microasperities on said planar surface, each of said microasperities having a gently sloping front surface, and a sharply sloping rear surface.

4,323,402

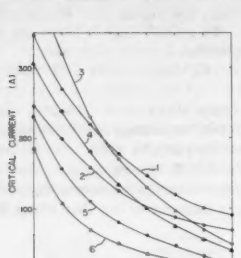
METHOD FOR PRODUCING SUPERCONDUCTING NB_3SN WIRES

Kyoji Tachikawa, and Hisashi Sekine, both of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Continuation-in-part of Ser. No. 118,994, Feb. 6, 1980, abandoned. This application Mar. 31, 1981, Ser. No. 249,473
Claims priority, application Japan, Feb. 9, 1979, 54-13407
Int. Cl.³ H01L *39/00*; C23C *1/04*
U.S. Cl. 148—133 **3 Claims**

1. In a method of producing a superconducting Nb_3Sn wire which comprises passing a wire or tape of a niobium-base alloy through a molten metal bath containing tin and then heat-treating it to form a Nb_3Sn compound layer on the surface of said wire or tape, the improvement wherein said niobium-base alloy is an alloy comprising niobium and 0.1 to 30 atomic percent of hafnium, and said molten metal bath is a molten bath of a tin-base alloy consisting of tin, from 0.1 to 70 atomic percent of one element of Group IIIb of the periodic table selected from the group consisting of gallium, indium and aluminum, and

from 0.1 to 70 atomic percent of one element of Group Ib of the periodic table selected from the group consisting of copper



and silver, the total amount of the element of Group IIIb and the element of Group Ib not exceeding 70 atomic percent.

4,323,403

CONTINUOUS ANNEALING METHOD FOR COLD REDUCED STEEL STRIP

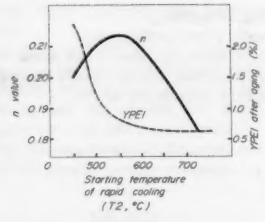
Kazuhide Nakaoka; Kenzi Araki, both of Yokohama; Kozi Iwase, Machida; Haruo Kubotera; Takao Kurihara, both of Yokohama, and Nobuo Tanaka, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 926,192, Jul. 19, 1978, abandoned, which is a continuation of Ser. No. 715,863, Aug. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 558,840, Mar. 17, 1975, abandoned, which is a continuation of Ser. No. 373,744, Jun. 22, 1973, abandoned. This application Jul. 23, 1979, Ser. No. 60,028

Claims priority, application Japan, Jun. 22, 1972, 47/61813

Int. Cl.³ C21D *6/00, 9/52*

U.S. Cl. 148—134 **2 Claims**



1. In a continuous annealing process for cold reduced steel strip, of which kind of steel are low carbon rimmed, low carbon Al-killed, low carbon Si-killed steel and of which coiling temperature at hot rolling stage are above 680° C. and of which the continuous annealing process is composed of heating the strip to a temperature of more than recrystallization temperature, rapidly cooling said strip, reheating said strip to a temperature within the range of 300° C. to 500° C. for more than 10 seconds and cooling said strip to room temperature, the improvement of imparting to said steel strip immediately after the completion of said annealing process of an n-value of more than 0.21, and a yield point elongation of zero percent wherein said steel strip is slowly cooled in said heating step for a period of time of about 100 seconds to a temperature in the range of between 500° C. and lower than 600° C. and subsequently rapidly cooling from said temperature range at a rate of over 200° C./sec to below 4,000° C./sec to said room temperature, and wherein upon subjecting said steel strip to equivalent natural aging for 2 months at room temperature, said n-value decreases about 10%, and the yield point elongation is held to an increase of no more than 1.2%.

4,323,404

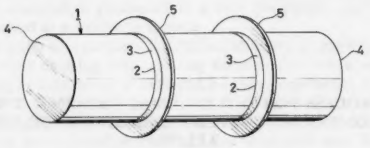
METHOD FOR PROVIDING SINGLE PIECE WITH PLURAL DIFFERENT MECHANICAL CHARACTERISTICS

Susumu Sawada, Muroran; Takashi Fukuda, Noboribetsu; Katsuhiro Tsuchiya, Muroran, and Kazuo Ito, Noboribetsu, all of Japan, assignors to The Japan Steel Works Ltd., Tokyo, Japan

Filed May 7, 1980, Ser. No. 147,453

Int. Cl.³ C21D *1/78*

U.S. Cl. 148—148 **4 Claims**



1. A method for producing a metal piece having plural sections of different mechanical characteristics comprising the steps of: dividing a piece to be treated into plural sections by at least one groove, filling said groove with heat insulating material, forming a partitioning wall along each said groove, heating each section to a different temperature, and cooling each of said sections to thereby impart different mechanical or metallurgical characteristics to each of said sections.

4,323,405

CASING HAVING A LAYER FOR PROTECTING A SEMICONDUCTOR MEMORY TO BE SEALED THEREIN AGAINST ALPHA PARTICLES AND A METHOD OF MANUFACTURING SAME

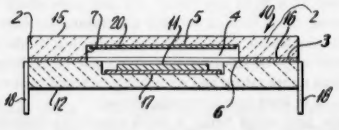
Koichi Uno, and Shinichi Murakami, both of Nagoya, Japan, assignors to Narumi China Corporation, Nagoya, Japan

Filed Dec. 19, 1979, Ser. No. 105,196

Claims priority, application Japan, Dec. 28, 1978, 53/161168

Int. Cl.³ H01L *23/06*

U.S. Cl. 156—64 **2 Claims**



1. A method of manufacturing a casing for a semiconductor memory element, said element having a semiconductor substrate and a plurality of memory circuits, said substrate having a first surface and a second surface opposite to said first surface, said memory circuits being formed adjacent to said first surface, said casing comprising:

a base member and a cap member, said cap member having a peripheral region having a peripheral surface to be hermetically sealed on said base member, a center region surrounded by said peripheral region and having a center surface offset relative to said peripheral surface to form a hollow space in said casing when said base and said cap members are sealed together, and a wall surface between said center and said peripheral surface, said substrate being held on said base member with said first surface directed to said hollow space, and with said second surface brought into contact with said base member, said cap

member irregularly emitting alpha particles that adversely affect operation of said semiconductor memory element, said method comprising the step of:

preparing at least one protected material against said alpha particles;

determining a thickness of a protection layer formed by said protective material, said thickness being not less than the range in said protective material of said alpha particles emitted by said cap member; and

attaching said protection layer to said center surface to prevent said alpha particles from being emitted from said cap member into said hollow space and onto said first surface.

4,323,406

MANUFACTURING PROCESS FOR COVERING PANELS, AND PANELS OBTAINED WITH THIS PROCESS

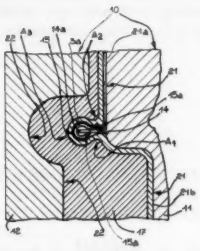
Sergio Morello, Via Passione, 9, Milan, Italy

Filed Apr. 14, 1980, Ser. No. 140,088

Claims priority, application Italy, Apr. 27, 1979, 3388 A/79

Int. Cl.³ B29D *3/00, 9/00*

U.S. Cl. 156—91 **4 Claims**



1. A process for covering a panel, including use of a die-counterdie unit (10) in which a surface (21) of a die (11), defining the outside surface of the corresponding panel (1), has at least one plate protrusion (14) separating the die (21) into at least two prefixed portions, comprising:

(a) adhering a first sheet (3) to one of the portions (21*a*) of the die surface (21), such that the edge (3*a*) of said first sheet folds over and envelops the end (14*a*) of said protrusion (14);

(b) securing by elastic means, the folded edge (3*a*) of said first sheet at the end (14*a*) of said protrusion (14);

(c) adhering a second sheet (2) to said first sheet (3) and the remaining portion (21*b*) of said die surface (21);

(d) closing the die-counterdie unit (10), and injecting synthetic resin into a hollow space (17) between the said second sheet (2) and the surface (22) of the counterdie (12);

(e) opening, after a prefixed time, said unit; and

(f) detaching the panel from the die with simultaneous removal of said protrusion from the folded edge of said first sheet, leaving said elastic means within said panel.

4,323,407

ENDLESS PRESSURE BELTS FOR USE IN CONTINUOUS PRESSING AND DECATIZING DEVICES

Dieter Riedel, Porta Westfalica, Fed. Rep. of Germany, assignor to Drabert Sohne Minden (Ger. Body Corp.), Minden, Fed. Rep. of Germany

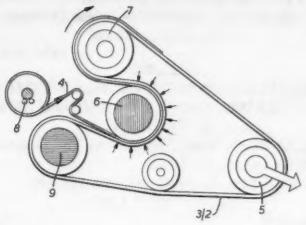
Filed Sep. 29, 1980, Ser. No. 192,327

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939637

Int. Cl.³ B32B *31/20, 31/12*

U.S. Cl. 156—91 **3 Claims**

1. A method of manufacturing an endless pressure belt for use on a device for the continuous pressing and decatizing of woven and knitted fabrics and the like, said method comprising: providing an endless fabric made of aromatic polyamide fibres, stitching a synthetic fibre skin to at least one side of said



fabric, pressing at least one layer of rubber at room temperature onto the skin, and vulcanising the structure while longitudinal tension is being applied.

4,323,408

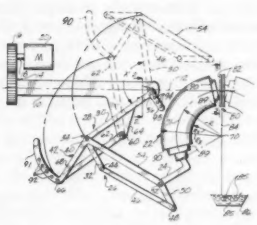
FILAMENT WINDING OF PLASTIC ARTICLES

William R. Dana, Corona del Mar; Ralph S. Friedrich, Hermosa Beach, and John D. McKenney, South Laguna, all of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Filed Sep. 25, 1979, Ser. No. 78,887

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—175 **24 Claims**



1. A method for making a pipe fitting having a nonlinear centerline lying in a substantially flat plane by wrapping filaments around a mandrel in the shape of the fitting, the method comprising the steps of:

disposing the mandrel adjacent a winding station;

rotating the mandrel about an axis which is fixed in space and which lies in the plane of the nonlinear centerline;

passing the rotating mandrel through the winding station while maintaining the nonlinear centerline substantially tangent to the axis of rotation at the winding station;

wrapping filaments around the mandrel in a curved path as it moves past the winding station; and

applying a curable resin to the filaments.

7. Apparatus for making a nonlinear pipe fitting by winding filaments in continuous curved paths around a mandrel in the shape of the fitting, the mandrel having a longitudinally extending nonlinear centerline, the apparatus comprising:

a spindle having a longitudinal axis;

an outwardly extending bracket secured to the spindle;

means for securing the mandrel to the bracket;

dispensing means for supplying filaments to the mandrel;

means for rotating the spindle about its longitudinal axis, the axis of spindle rotation having a fixed orientation relative to the dispensing means;

means for simultaneously moving the bracket and mandrel laterally and longitudinally relative to the spindle about an axis spaced from and transverse to the spindle axis as the spindle rotates to cause the centerline of the mandrel to

move through a point substantially on the longitudinal axis of the spindle and at a substantially fixed distance from the last point of contact between the filaments and the delivery means so the filaments wind around the mandrel in a continuous curved path; and

means for applying a curable resin to the filaments.

4,323,409

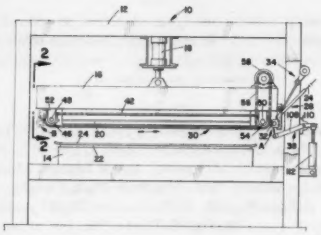
APPARATUS AND METHOD FOR FORMING DIELECTRICALLY SEALED LAMINAR SHEET MATERIALS

Rudolph Alt, Methuen, Mass., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Feb. 28, 1980, Ser. No. 125,499

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—219 **33 Claims**



1. In an apparatus for dielectrically sealing a strap of relatively flexible material to a base sheeting material of predetermined width and arbitrary length comprising a press including a first platen having an electrode bar mounted thereto and a second platen, said platens being operable between an opened position for material feed and a closed position for dielectric sealing, dielectric sealing means connected between said electrode bar and second platen, means for advancing said base material lengthwise in predetermined increments between said platens and transversely of said electrode bar, the improvement comprising a strap feeder assembly for feeding said strap material between said electrode bar and base material in correlation with the operation of said platens, said strap feeder assembly including a grab bar arranged to reciprocate back and forth across the width of said base material, strap threader means arranged to feed a free end of said strap material extending from a tensioned supply thereof to said grap bar, said grab bar having relatively movable first and second members arranged to grasp said free end of said strap material and to pull a predetermined length of said strap material from said supply thereof across the width of said base material to position and hold said strap material in a tensioned condition adjacent said electrode bar for dielectric sealing to said base material.

4,323,410

METHOD OF MANUFACTURING SEAT CUSHIONS

Muneharu Urai, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

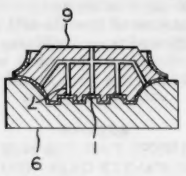
Filed Oct. 22, 1980, Ser. No. 199,436

Claims priority, application Japan, Oct. 31, 1979, 54/139835

Int. Cl.³ B32B *31/04, 31/12, 31/20*

U.S. Cl. 156—228 **7 Claims**

1. A method of manufacturing a permeable seat cushion comprising the steps of preparing a seat surface covering of fabric material including side portions integrally joined to the peripheral edges of a seating portion of the seat cushion, placing said seat surface covering in a turned-over relation on a lower die of shape complementary to that of the seat surface covering, heating said seating portion while fixing said seating portion at the joint between it and the side portions, urging an upper die of the same shape as that of said seating portion toward and onto said lower die supporting said seat surface covering thereon thereby shaping said seat surface covering into a desired configuration, urging said upper die away from said lower die while said seat surface covering is maintained in position on said lower die, applying a bonding agent to at least one of the back surface of said seating portion and the front surface of a skinless molded block or profile-cut slab of cushion



providing material of the same shape as that of the front surface of said seat cushion, bonding said molded block or profile-cut slab of cushion providing material to said seating portion of said seat surface covering, removing the assembly from said lower die, and turning over said side portions of said seat surface covering to provide said seat cushion.

4,323,411

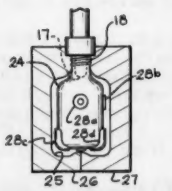
METHOD FOR APPLYING PREFABRICATED PARTS TO BLOW MOLDED ARTICLES

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 726,967, Sep. 27, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 922,913

Int. Cl.³ B32B *1/10;* **B29C** *17/07, 17/08;* **B29D** *3/00*

U.S. Cl. 156—245 **2 Claims**



1. A method for forming a hollow article from a thermoplastic material comprising the steps of: forming a parison from a heated mass of said material; blowing the parison in a cavity in a first mold defining a shape smaller than the article to form a preform; removing the preform from the first mold cavity; attaching at least one prefabricated part to an external surface area on the preform; positioning the preform and the attached part in a cavity in a second mold defining the external shape of the article; blowing the preform into contact with the second mold whereby the preform is shaped into the article with the part at least partially embedded in the article; removing the article from the second mold cavity; positioning a die against the article adjacent the prefabricated part; and drawing the prefabricated part from the article and into the die to cut an opening in the shape of the part into the article.

4,323,412

PROCESS OF IMPREGNATING PAPER LAMINATE PLIES WITH OIL MODIFIED PHENOLIC RESOLE VARNISH

LeRoy A. Claybaker, Coshocton, Ohio, assignor to General Electric Company, Coshocton, Ohio

Division of Ser. No. 745,733, Nov. 29, 1976, Pat. No. 4,254,187, which is a division of Ser. No. 562,526, Mar. 27, 1975, Pat. No. 4,043,954. This application Aug. 4, 1980, Ser. No. 174,938
Int. Cl.³ C09J 3/14
U.S. Cl. 156—335 5 Claims

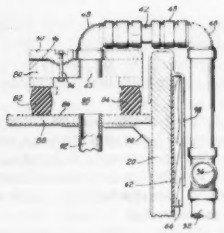
1. The process of preparing a laminate which comprises impregnating paper laminate plies with an impregnating varnish made by (a) reacting a phenol moiety with tung oil in the presence of strong acid and (b) reacting the product of (a) in an alcohol solvent with an aldehyde moiety in the presence of an amine catalyst using as the alcohol solvent a mixture consisting of, by weight, from 15 to 50 percent methyl alcohol and 85 to 50 percent isopropyl alcohol, the reaction product of (b) being dissolved in a solvent, laying up the plies and consolidating under heat and pressure.

4,323,413

APPARATUS FOR MAKING TRUCK BODIES, UNITIZED SHELLS AND PANELS

Michel Trempe, 157 Principale St., St. Alexis de Montcalm, Canada (J0K 1T0)

Filed Jul. 22, 1980, Ser. No. 171,140
Int. Cl.³ B32B 31/00
U.S. Cl. 156—382 4 Claims



1. A vacuum bag apparatus for making an integral truck body out of panels covered with an outside layer of fiber-reinforced plastic material bonded thereto, comprising:

(a) a mold having a bottom wall, an end wall and two side walls joined together and having internal dimensions corresponding to the size of the truck body, each wall being adapted to be lined with panels, which are covered on at least one surface with a layer of fiber-reinforced plastic material adapted to be bonded thereto;

(b) a grid of inter-connected perforated air conduits adapted to be positioned in the mold adjacent the walls thereof;

(c) a vacuum bag membrane engaging the outside surface of the grid of perforated air conduits and defining a sealed chamber with the bottom wall, end wall and side walls, of the mold; and

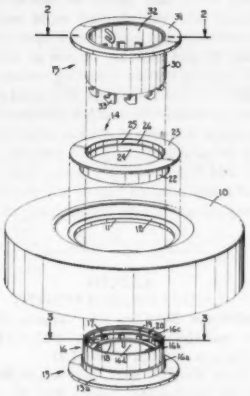
(d) means for evacuating said conduits to form a vacuum within said sealed chamber, so as to compress and bond the layer of fiber-reinforced plastic material to said panels.

4,323,414

SELF-SEALING CURING RIM FOR TUBELESS EARTHMOVER TIRE

Larry A. Severson, West Fargo, N. Dak., assignor to Branick Mfg., Inc., Fargo, N. Dak.

Filed Aug. 21, 1980, Ser. No. 180,152
Int. Cl.³ B29H 17/00
U.S. Cl. 156—414 14 Claims



1. A rim for supporting a vehicle tire during a curing operation, comprising:

(a) a first sleeve, having a flanged first end and a second end, adapted to seal the bead of a tire;

(b) a flanged sealing sleeve adpated to seal the bead of the tire opposite from the first sleeve, said sealing sleeve having a cylindrical inner surface with an annular groove formed therein;

(c) a locking sleeve having first and second ends, comprising a cylindrical outer wall portion and an annular stop flange at said first end, telescoped within said sealing sleeve to permit relative axial movement therebetween;

(d) means including sealing means for securing together said first and locking sleeves at their second ends for support between them of a vehicle tire during a curing operation;

(e) a gasket member in said groove to engage said cylindrical outer wall portion; and

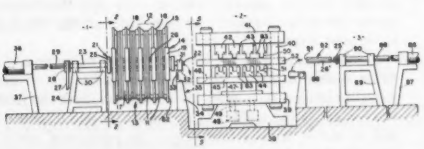
(f) an air inlet in said rim, said sealing sleeve being constructed and arranged to maintain an air-tight seal with the bead of the tire as the tire is inflated and to move therewith along said outer wall portion of said locking sleeve until blocked by said stop flange of said locking sleeve.

4,323,415

METHOD AND APPARATUS FOR SIMULTANEOUSLY MOLDING A PLURALITY OF PARTS

Leonard S. Meyer, Columbia, S.C., assignor to Victor United, Inc., Chicago, Ill.

Filed May 27, 1980, Ser. No. 153,217
Int. Cl.³ B29D 3/02, 9/00
U.S. Cl. 156—433 24 Claims



1. An apparatus for molding parts from bundles of rein-

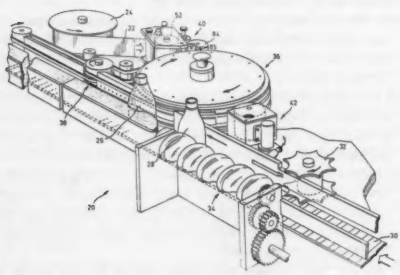
forced resins including, a loading station having a shiftable carrier, a winding frame assembly removably mountable upon said carrier and having a frame section adapted to support a wound bundle comprising resin impregnated strands, a molding station adjacent said loading station and provided with opposed mold sections displaceable between an open spaced-apart position and a closed mating position, opposed guide means in said molding station disposed in a plane intermediate said mold sections when in said open position to receive said frame assembly when said carrier is shifted to an extended position between said spaced-apart mold sections, movable means associated with said guide means operable to retain said frame assembly in said molding station as said carrier is retracted to said loading station, actuating means in said molding station operable to displace said opposed mold sections from an open to a closed position with said bundle sandwiched between said mold sections, a removal station adjacent said molding station, and a shiftable carrier on said removal station extendible to engage said frame assembly within said molding station to retract said frame assembly from said molding station following molding of said bundle and opening of said mold sections.

4,323,416

LABELLING EQUIPMENT

Martin D. Malthouse, 204 Glen Rd., Toronto, Ontario, Canada (M4W 2X1), and Heinz K. Groeger, #63, 85 Henderson Dr., Thornhill, Ontario, Canada (L3T 2L2)

Filed Nov. 28, 1979, Ser. No. 98,085
Claims priority, application Canada, Dec. 5, 1978, 317428
Int. Cl.[3] B65C *9/04, 9/26*
U.S. Cl. 156—521 **4 Claims**



1. Labelling equipment for applying wrap-around labels to cylindrical containers, the equipment comprising:

a label carrier having a wheel rotatable about its axis;

a vacuum system coupled to the wheel to retain labels on the wheel;

a feeder for directing containers individually to the wheel adjacent the periphery of the wheel to receive a label;

a drive system for receiving containers from the feeder and for rolling the containers upon receiving the label from the label carrier, the drive system including at least one belt engaged about the wheel in slipping relationship therewith to permit the belt to move faster than the periphery of the wheel and including a portion for moving in contact with the container immediately after the container leaves the feeder to both carry the label off the wheel and to engage it on the container;

drive means coupled to the label carrier, the feeder and the drive system to cause the containers and labels to move together immediately after the containers leave the feeder, to then apply the labels to the containers and to cause the belt to move slightly faster than the peripheral speed of the wheel so that the labels are in tension as they move individually from the wheel to containers, and

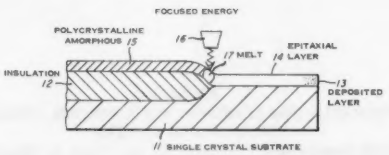
a label feeder assembly coupled to the drive means and positioned to supply labels to the label carrier, the label feeder assembly being mounted about a second axis parallel to said wheel axis whereby this assembly can be moved about this second axis to facilitate service and maintenance, said label feeder assembly including a cutter head driven to sever labels from a strip of labels and having a stationary blade inclined with respect to said second axis and a driven blade coupled to the drive means for rotation to combine with the stationary blade once in every revolution to sever the labels from the strip, the driven blade being parallel to said second axis so that the blades combine to cut the strip from one edge to the other progressively.

4,323,417

METHOD OF PRODUCING MONOCRYSTAL ON INSULATOR

Hon W. Lam, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 6, 1980, Ser. No. 147,408
Int. Cl.[3] C30B *19/00*
U.S. Cl. 156—613 **9 Claims**



1. A method for producing monocrystal on insulator comprising the steps of:

(a) depositing a layer of material on a surface of a single crystal substrate having an insulator region formed therein;

(b) transforming, via epitaxial growth induced above the single crystal substrate, said layer of material into an epitaxial layer overlying the single crystal substrate and a polycrystal or amorphous layer overlying said insulator region; and,

(c) scanning a focused energy source, from a starting zone within said epitaxial layer to a stopping zone lying inside the polycrystalline or amorphous layer such that the region of polycrystalline or amorphous layer so scanned is melted, whereby on resolidifying, said scan area will resolidify as monocrystal.

4,323,418

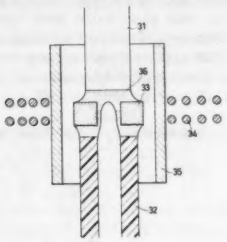
METHOD FOR GROWING A PIPE-SHAPED SINGLE CRYSTAL

Toshio Kobayashi, Hinodemachi, and Tetsu Oi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1979, Ser. No. 92,671
Claims priority, application Japan, Nov. 10, 1978, 53/137875
Int. Cl.[3] C30B *15/24*
U.S. Cl. 156—617 SP **16 Claims**

1. A method for growing a pipe-shaped single crystal which comprises providing a starting material at one side of a susceptor and locating a seed crystal on the other side thereof, said susceptor being provided with a hole in its central portion so as to grow said pipe-shaped crystal, maintaining the susceptor at a temperature not lower than the melting point of said starting material by radio frequency induction heating, and causing a melt produced by the melting of said starting material to flow from said one side of said susceptor via said susceptor to said other side thereof, whereby said melt is made

to contact said seed crystal, and moving said seed crystal at a predetermined rate in a direction away from said susceptor and



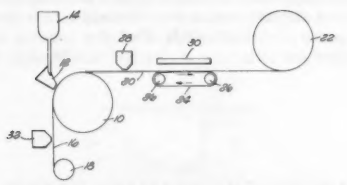
simultaneously feeding said starting material to said one side of said susceptor at a predetermined rate.

4,323,419

METHOD FOR RIBBON SOLAR CELL FABRICATION

G. Felix Wakefield, Woodland Hills, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 8, 1980, Ser. No. 147,765
Int. Cl.³ B22D *11/06*; H01L *31/18*
U.S. Cl. 156—622 **13 Claims**



1. A method of casting a ribbon of crystallized material on a metal backing or a backing having a metal layer and a layer of cast material-metal alloy, comprising:

extruding, at a region of extrusion, a ribbon of the material to be cast in a molten form onto an elongated strip of metal foil, drawn past the region of extrusion on a cooled surface moving past the region of extrusion, the ribbon of molten material having a form, and the metal of the foil having a melting point or forming with the molten material to be cast an alloy having a melting point, sufficiently below that of the molten material to be cast, so that at least a sufficient portion of the metal of the foil contacted by the molten material to be cast will melt, or form a melted alloy with the molten material to be cast, to provide a liquid layer upon which crystallization of the molten material to be cast occurs in conjunction with solidification of the material of the liquid layer.

4,323,420

PROCESS FOR MANUFACTURE OF INERTIAL CONFINEMENT FUSION TARGETS AND RESULTING PRODUCT

Nino A. Masnari; Walter B. Rensel; Merrill G. Robinson; David E. Solomon; Kensall D. Wise, all of Ann Arbor, and Gilbert H. Wuttke, Ypsilanti Township, Washtenaw County, all of Mich., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

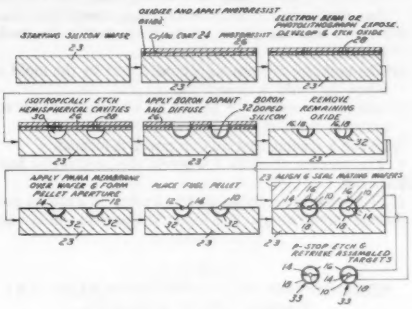
Filed Jul. 17, 1978, Ser. No. 925,437
Int. Cl.³ G21B *1/00*
U.S. Cl. 156—628 **8 Claims**

1. In a process for manufacture of fusion fuel targets comprising the steps of: (a) forming a pair of hemispheric shell segments, (b) suspending a spherical pellet of fusion fuel within one of said shell segments, and (c) joining the shell segments to each other with said pellet being contained concentrically therewithin, the improvement for production of said targets in quantity wherein said step (a) comprises the steps of:

(d) forming a plurality of hemispheric mold cavities in a substrate material by

(d1) depositing a metal film on a working surface of said substrate material,

(d2) photolithographically or electron-beam lithographically forming in said metal film a mask for the underlying substrate material,


OXIDIZE AND APPLY PHOTORESIST
STARTING SILICON WAFER
ELECTRON BEAM OR PHOTOLITHOGRAPHIC EXPOSE, DEVELOP & ETCH OXIDE
ISOTROPICALLY ETCH HEMISPHERICAL CAVITIES
APPLY BORON DOPANT AND DIFFUSE
BORON DOPED SILICON
REMOVE REMAINING OXIDE
APPLY PARYLA MEMBRANE OVER WAFER & FORM PELLET APERTURE
PLACE FUEL PELLET
ALIGN & SEAL MATING WAFERS
P-STOP ETCH & RETRIEVE ASSEMBLED TARGETS

(d3) etching said underlying substrate material through said mask to form a plurality of hemispheric mold cavities in said substrate material, and then

(d4) removing said mask to expose said working surface including said hemispheric mold cavities,

(e) forming in each of said mold cavities a thin film of desired shell material, and

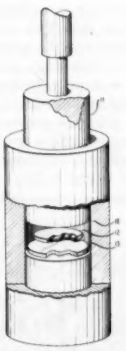
(f) removing said films from said mold cavities to form said plurality of hemispheric shell segments.

4,323,421

FABRICATION OF CONDUCTOR-CLAD COMPOSITES USING MOLDING COMPOUNDS AND TECHNIQUES

Theodore H. Klein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 900,937, Apr. 28, 1978, abandoned. This application Feb. 15, 1980, Ser. No. 121,821
Int. Cl.³ B32B *31/06, 31/24*; H05K *3/06*
U.S. Cl. 156—630 **17 Claims**



1. A process for producing conductor-clad printed wiring board composites comprising,

placing a quantity of substantially uncured polymeric mold-

ing compound in a heated compression molding apparatus;

compression molding and curing the compound; the invention characterized in that

(a) the linear dimensions of the molding compound charge placed within the molding apparatus are less than the interior linear dimensions of the mold face upon which it is placed,

(b) a conductive foil of thickness less than 7 mils is placed upon, and supported by, the molding charge, prior to molding,

(c) the linear dimensions of the conductive foil are less than the interior linear dimensions of the mold face, but greater than the linear extent of the molding compound charge,

(d) the compound is caused to flow during the molding process,

(e) the molding compound is constrained by the mold walls when the mold is closed, and

(f) the foil is smooth to within 20 microinches rms subsequent to molding,

whereby a conductor-clad composite is formed.

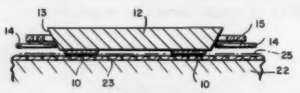
2. The process of claim 1 wherein the conductive foil is a copper foil.

17. The process of claims 2 and 16 wherein a circuit pattern is defined on the conductive foil subsequent to the molding.

4,323,422
METHOD FOR PREPARING OPTICALLY FLAT DAMAGE-FREE SURFACES

Arthur R. Calawa, 6 Abbott La., Chelmsford, Mass. 01824; Joseph V. Gormley, 14 Gail Rd., Merrimack, N.H. 03054, and Michael J. Manfra, 240 N. Billerica Rd., Tewksbury, Mass. 01876

Filed Apr. 24, 1980, Ser. No. 143,380
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—636 **2 Claims**



1. A method for preparing optically flat surfaces of a semiconductor material comprising the steps of

placing a first surface to be prepared adjacent, but not in contact with, a second surface, said first and second surfaces being movable relative to each other, said first surface being freely positioned relative to said second surface so that the distance therebetween can be freely varied;

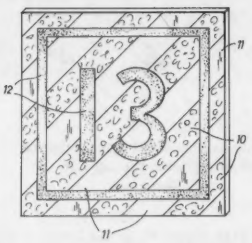
applying a fluid selected from a mixture of methanol, ethylene glycol and bromine to said second surface to form a fluid layer between said first and second surfaces, the viscosity of said fluid and the speed of the relative movement of said surfaces being selected to be sufficiently high to cause said first surface to hydroplane on said fluid and said viscosity being sufficiently low that the surface tension of said fluid does not prevent the hydroplaning action, the hydroplaning action thereby removing portions of said first surface in a manner so as to cause said first surface to become optically flat.

4,323,423
DECORATIVE GLASS CHIPPING METHOD

Thomas R. Schrunk, 2306 NE. Garfield St., Minneapolis, Minn. 55418

Continuation of Ser. No. 48,891, Jun. 18, 1979, abandoned. This application Sep. 11, 1980, Ser. No. 186,318
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—645 **1 Claim**

1. A method for making a decorative pane of glass having a total area consisting of desired clear, etched and chipped areas with clearly delineated boundaries therebetween, comprising the steps of providing a pane of glass, etching predetermined areas of said glass which include only said desired etched and chipped areas to provide predetermined etched areas and said desired clear areas, applying a layer of glue having shrinkage characteristics to said glass to at least cover said desired chipped areas, forming scribed lines in said layer of glue during a time interval after said layer has begun to harden but prior to any appreciable adhesion of said layer to said glass, said scribed

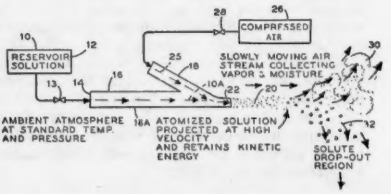


lines including a first set of lines which trace the boundaries of said desired chipped areas relative to the boundaries of said desired clear areas within the periphery of said pane of glass, said scribed lines including a second set of lines laterally within the boundaries of said predetermined etched areas which constitute the only means employed to form boundaries between said desired chipped areas and said desired etched areas, and removing the portion of said layer of glue covering said desired etched and clear areas during said time interval.

4,323,424
LIQUID-SOLIDS SEPARATION PROCESS

David J. Secunda, 3500 E. Lincoln Dr., Phoenix, Ariz. 85018, and Lloyd Motz, 815 W. 181st St., New York, N.Y. 10027

Filed Aug. 25, 1980, Ser. No. 181,313
Int. Cl.³ B01D *1/16*
U.S. Cl. 159—48 R **12 Claims**



1. Method for the rapid separation of a liquid composition which contains solid dissolved or suspended therein which comprises:

(a) atomizing said composition to droplets substantially in the range of 0.5 to 6.0 microns in diameter;

(b) projecting the atomized droplets in the form of a spray at a velocity of 600 feet per second to sonic velocities directly into a mass of relatively dry, ambient, unheated air maintained at substantially standard temperature in an entrainment zone;

(c) separating dry solid particles from liquid evaporated from the droplets within a short distance of the point of projection into the entrainment zone; and

(d) recovering separated solid particles from the entrainment zone.

4,323,425
PAPER SIZING

Edwin Dowthwaite, Frampton, and Ian R. Hiskens, Oldfield Park, both of England, assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Continuation of Ser. No. 730,908, Oct. 8, 1976, abandoned, which is a continuation of Ser. No. 577,485, May 14, 1975, abandoned, which is a division of Ser. No. 435,561, Jan. 22, 1974, Pat. No. 3,906,142. This application Mar. 21, 1980, Ser. No. 132,505

Claims priority, application United Kingdom, Jan. 22, 1973, 3145/73

Int. Cl.[3] D21H *3/34, 3/36*

U.S. Cl. 162—168 N 7 Claims

1. A method for the preparation of sized cellulosic paper in the absence of aluminum sulfate which comprises adding a polyamine retention aid and a stable aqueous dispersion of fortified rosin to a cellulosic paper pulp slurry, forming a sheet from the pulp slurry, and drying the resultant sheet; said aqueous dispersion comprising water, a protective colloid, a volatile base and fortified rosin, at least 90% of said fortified rosin being unsaponified.

5. Sized cellulosic paper prepared by the method of claim 1.

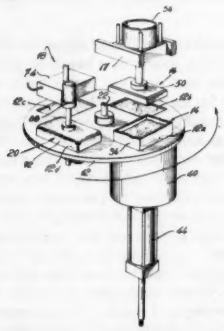
4,323,426
CRAFTED PAPER MAKING MACHINE

Wavell F. Cowan, Montpelier; Marshall S. Green, Waterbury Center, both of Vt., and Stanley E. McGurk, Westmount, Canada, assignors to Inotech Process Ltd., Quebec, Canada

Filed Nov. 13, 1979, Ser. No. 93,743

Int. Cl.[3] D21J *3/12*

U.S. Cl. 162—398 13 Claims



1. An apparatus for forming paper comprising:

at least one carrier provided with a filter medium defining a mold suitable for forming a sheet of paper;

means for conveying said carrier sequentially to first, second, third, and fourth treatment stations, said means comprising a turntable mounted for rotation about a vertical axis, whereby said carrier is rotated into each of said stations;

said first station including means for supplying a fiber suspension liquid to said filter medium and means for drawing said liquid through said filter medium whereby the fibers are left on said mold forming a sheet;

said second station comprising means for applying a pressure against said formed sheet whereby excess liquid is forced from said sheet through said filter medium;

said third station comprising heating means for drying the sheet whereby a removable sheet of paper is obtained from said mold; and

said fourth station comprising a sheet pickup means adjacent the turntable and adapted to pickup and remove the sheet from the mold.

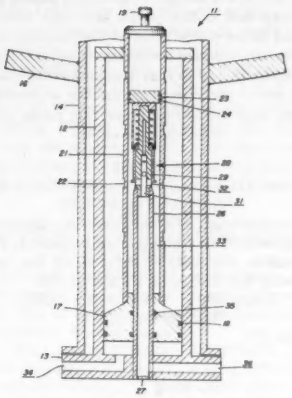
4,323,427
DECELERATION BUFFER FOR HYDRAULIC LINEAR MOTION DRIVE

Kenneth J. Jamrus, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Sep. 10, 1979, Ser. No. 73,720

Int. Cl.[3] G21C *7/08*

U.S. Cl. 376—230 4 Claims



1. In a vertically oriented linear motion-producing device for a nuclear reactor including a stationary elongated main cylinder, a stationary elongated tubular element coaxially disposed in said main cylinder to provide an annular drive fluid space between said tubular element and said main cylinder, a double-acting driving piston reciprocably disposed in said annular drive fluid space, a connecting tube secured to said driving piston and extending from said annular drive fluid space for connection to a load, and means for introducing and removing drive fluid to and from said annular drive fluid space to move said driving piston and said connecting tube in either direction, the improvement comprising buffer apparatus for braking said driving piston near the end of its upward stroke including: a buffer cylinder positioned within said connecting tube and open at its lower end; a buffer shaft connected at its lower end to said tubular element, extending coaxially through said buffer cylinder and secured at its upper end thereto, said buffer shaft being formed with a longitudinal bore closed at its upper end and open to said tubular element at its lower end and with a small diameter portion within said buffer cylinder, a diameter transition forming a shoulder near the open end of said buffer cylinder and a large diameter portion between the open end of said buffer cylinder and the upper end of said tubular element; an annular buffer piston disposed coaxially on said buffer shaft and providing an annular buffer fluid flow space therebetween, said buffer piston having an outside diameter sized for sliding fit in said buffer cylinder, said buffer piston being formed with an upper flange with an inside diameter sized for sliding fit on said small diameter portion of said buffer shaft and being formed with a lower flange with an inside diameter sized for sliding fit on said large diameter portion of said buffer shaft; spring means in said buffer cylinder urging said buffer piston out of said buffer cylinder whereby said upper flange of said buffer piston normally engages said shoulder of said buffer shaft; a fluid-tight plug in said bore of said buffer shaft positioned below said shoulder of said buffer shaft and dividing said bore into a lower bore portion and an upper bore portion, said plug and the engagement of said upper flange of said buffer piston against said shoulder of said buffer shaft normally sealing said cylinder against escape of buffer fluid therefrom; a radial hole in said large diameter portion of said buffer shaft providing a fluid passage between said annular buffer fluid flow space and said lower bore portion of said

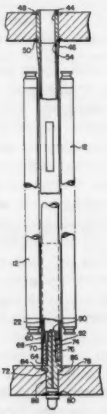
buffer shaft; a plurality of relatively small radical braking holes providing fluid passages between the interior of said buffer cylinder and said upper bore portion of said buffer shaft; fluid passage means in said buffer shaft near said buffer shaft shoulder providing fluid passage from said upper bore portion of said buffer shaft to said annular buffer fluid flow space when said upper flange of said buffer piston is unseated from said shoulder of said buffer shaft by engagement of said driving piston with said lower flange of said buffer piston, said driving piston moving said buffer piston into said buffer cylinder whereby said buffer piston seals off said braking holes in succession to thereby increase resistance to buffer fluid flow from said buffer cylinder and to thus dissipate the kinetic energy of the driving piston and connected moving elements to reduce their velocity near the end of the driving piston to stroke.

4,323,428

RECONSTITUTABLE FUEL ASSEMBLY FOR A NUCLEAR REACTOR

John M. Schallenberger, O'Hara Township, Allegheny County; Stanley Kmonk, Plum Borough, and Stephen J. Ferlan, Wilkins Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 7, 1979, Ser. No. 92,237
Int. Cl.[3] G21C *3/30*
U.S. Cl. 376—353 **6 Claims**



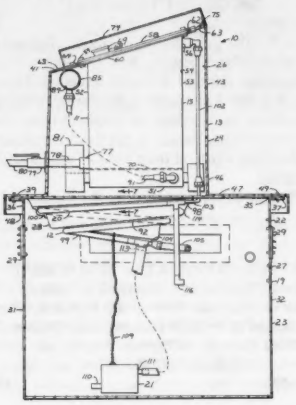
1. A reconstitutable fuel assembly comprising:
an array of parallel fuel rods held in spaced relationship with each other by grids spaced along the fuel rod length;
a multiplicity of control rod guide thimbles interspersed among said rods, said thimbles being immovably attached to said grids;
a top nozzle and bottom nozzle located at opposite ends of said fuel rods and guide thimbles;
separate upper and lower control rod guide thimble sleeves enclosing the ends of said control rod guide thimbles and being arranged to respectively interconnect said top and bottom nozzles with said grids;
each of said upper sleeves connecting said top nozzle with a grid including a section extending through the top nozzle and having an inner diameter just sufficient to accept a control adapted to reciprocate therein;
separate removable mechanical fasteners on the upper surface of said top nozzle, each of said fasteners having a configuration which permits locking engagement between a sleeve and said top nozzle, and stop members on the opposite side of said top nozzle, each of said stop members being positioned to coact with said nozzle and a sleeve having a fastener on the other side of the nozzle, to help removably lock the nozzle on said sleeves; and
means connecting the lower control rod guide thimble sleeves to said bottom nozzle.

4,323,429

SPENT SOLVENT PURIFICATION APPARATUS

Jack W. Hoover, 575 Valbon St., Orange Park, Fla. 32073

Filed Jun. 9, 1980, Ser. No. 157,443
Int. Cl.[3] B01D *3/00*; B08B *7/04*
U.S. Cl. 202—83 **7 Claims**



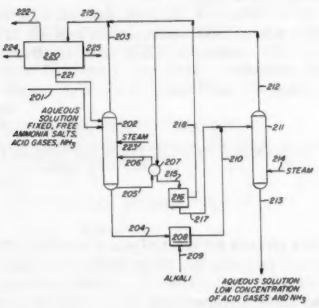
4. A portable outdoor distillation apparatus for use in recovering the acetone component of a batch of spent acetone solvent that includes said acetone component, said apparatus comprising a unit for treating said batch at substantially atmospheric pressure conditions to vaporize and separate the acetone component as acetone vapors from the residual material remaining from the vaporization treatment, a unit for condensing said acetone vapors at substantially atmospheric pressure conditions to thereby recover said acetone component as fresh solvent, and a ground supported housing for the units having a bottom section with a reservoir for containing a supply of cooling water, and a panel section which is secured to the bottom section and overlies the reservoir, said vaporizing unit comprising a fabricated aluminum container having a first chamber for receiving said batch and containing said residual material during the vaporization of said acetone component therein, a second chamber for receiving and containing a liquid heat exchange medium, and a horizontal interior wall that separates and serves to transmit heat between said liquid heat exchange medium and the batch of spent acetone solvent contained in the respective chambers, said ground supported housing having an upper section which is secured to the bottom and panel sections of the housing and forms a compartment over the panel section in which said vaporizing unit is located, said vaporizing unit comprising an electrical heating element which is located in said second chamber and energizable to heat the liquid heat exchange medium contained therein during the vaporization of said solvent component, said first chamber having a vapor zone for receiving the acetone vapors during the vaporization of said acetone component therein, said container having inlet forming means communicating with the vapor zone of the first chamber for admitting said spent acetone solvent to said first chamber, removable closure means closing the inlet of said inlet forming means, and outlet forming means communicating with said first chamber adjacent to said interior wall for draining said residual material remaining from the vaporization treatment of said batch therein, said upper section having a top wall and said container being secured to and suspended from said top wall, said condensing unit com-

prising a heat exchanger which is suspended from said panel section and has an elongated tubular means with opposite ends and a water jacket surrounding said tubular means between said opposite ends, said apparatus comprising conduit means communicating with said vapor zone and arranged to deliver the acetone vapors received therein to one of the opposite ends of said tubular means, said condensing unit further comprising pumping means connected to the heat exchanger and located in said reservoir for pumping cooling water from the supply contained in said reservoir through said water jacket and in indirect countercurrent heat exchange with the passage of condensed acetone vapors through the tubular means, and said heat exchanger being arranged to provide a gravity flow of the condensed acetone vapors from said one to the other of said opposite ends of said tubular means and said water jacket having a water inlet that is connected to receive the cooling water pumped by a pumping means and a water outlet that is arranged to pass the cooling water received in the water jacket back into said reservoir.

4,323,430
PROCESS FOR SEPARATING AMMONIA AND ACID GASES FROM STREAMS CONTAINING FIXED AMMONIA SALTS

Donald Glassman, Mt. Lebanon Township, Allegheny County, and Edward E. Maier, Murrysville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 16, 1981, Ser. No. 244,489
Int. Cl.³ B01D *3/38;* **C02F** *1/04*
U.S. Cl. 203—7 **34 Claims**


AQUEOUS SOLUTION FIXED, FREE AMMONIA SALTS, ACID GASES, NH3
STEAM
STEAM
ALKALI
AQUEOUS SOLUTION LOW CONCENTRATION OF ACID GASES AND NH3

1. In a process for achieving substantially complete removal of acid gases and ammonia from a dilute aqueous solution thereof, said solution also containing free and fixed ammonia salts, said process comprising:

(a) subjecting said solution to a first countercurrent multi-stage continuous distillation, said distillation being conducted by heating said solution, at least in part by means of a stripping vapor, and by having a gradient of ammonia concentration decreasing towards the region of bottom liquid withdrawal which results in said bottom liquid having a pH of less than about 8.0,

(i) withdrawing from this first distillation an overhead vapor stream containing a major proportion of stripping vapor, substantially all of said acid gases in said solution, and substantially all of the ammonia from said free ammonia salts,

(ii) withdrawing from this distillation an aqueous bottom stream which contains substantially all of said fixed ammonia salts;

(b) adding alkali to said withdrawn bottom stream, said alkali being added in an amount sufficient to evolve ammonia contained in said fixed ammonia salts during subsequent distillation of said mixture;

(c) subjecting said withdrawn bottom stream to a second counter-current multi-stage continuous distillation,

(i) withdrawing from this second distillation an overhead vapor stream said vapor stream containing a portion of the ammonia from said fixed ammonia salts,

(ii) withdrawing from this second distillation an aqueous bottom stream;

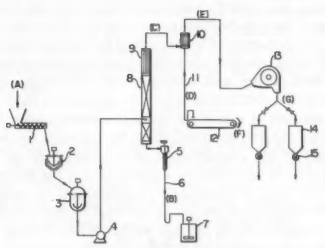
(d) vaporizing the aqueous bottom stream of step (a), at least in part (1) by heating said bottom stream by means of indirect heat exchange with at least a portion of the overhead vapor stream being withdrawn in step (c) and (2) by conducting said first distillation at a pressure substantially less than the pressure of the second distillation;

(e) passing said vapor stream from said first distillation through a condenser to concentrate the ammonia in the vapor stream leaving the condenser, the improvement comprising adding ammonia to said vapor stream from said first distillation to reduce corrosion of said condenser.

4,323,431
PURIFICATION OF COMPOUNDS HAVING HIGH MELTING POINT

Masatoshi Takahashi, Nishinomiya; Norio Kotera, Amagasaki; Masatoshi Uegaki, Nara; Takashi Miyaoka, Minoo, and Yuzo Maegawa, Oita, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed Aug. 4, 1980, Ser. No. 175,082
Claims priority, application Japan, Aug. 6, 1979, 54-100546
Int. Cl.³ B01D *1/22, 3/10;* **C07C** *97/24*
U.S. Cl. 203—72 **8 Claims**



1. A process for continuously purifying a crude, high melting, high boiling organic compound, which comprises:

(a) melting the crude organic compound;

(b) supplying the melt to a rectification zone kept under a subatmospheric pressure;

(c) partially condensing vapors distilled off from the top of the rectification zone by leading the vapors to a first partial condensation zone provided at the top of said rectification zone, the partial condensate being fed into the rectification zone as a reflux;

(d) further partially condensing the remaining vapors after said partial condensation in step (c) by leading said remaining vapors to a second partial condensation zone connected to said first partial condensation zone, thereby obtaining a second partial condensate which is a purified organic product;

(e) withdrawing said purified product to the outside of said rectification zone through a conduit establishing a first barometric leg;

(f) finally cooling the remaining uncondensed vapor in a vacuum rotary cooling zone or a total condensing zone; and

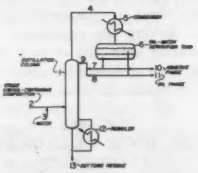
(g) withdrawing a liquid bottoms product containing at least one of higher boiling impurities and involatile impurities from a thin film evaporator with stirring blades provided at the bottom of the rectification zone through a conduit establishing a second barometric leg.

4,323,432

PROCESS FOR ISOLATING AND RECOVERING META- AND PARA-CRESOLS FROM CRUDE CRESOL-CONTAINING COMPOSITIONS COMPOSED OF CRESOL COMPONENTS, UNREACTED CYMENE COMPONENTS AND HIGH-BOILING BY-PRODUCTS

Yoshitaka Ohtani, Ohtake, and Junichi Nakagawa, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 165,981
Claims priority, application Japan, Jul. 6, 1979, 54-85015
Int. Cl.[3] B01D *3/36*
U.S. Cl. 203—85 6 Claims



1. A process for isolating and recovering meta- and para-cresols comprising distilling a crude meta-, para- and ortho-cresols-containing composition obtained by acid cleaving an oxidation product containing cymene hydroperoxide formed by the oxidation of a cymene isomeric mixture with a molecular oxygen-containing gas and distilling acetone off from the acid cleavage product, said composition comprising cresol components, unreacted cymene components and high boiling by-products having boiling points higher than that of para-cresol, in the presence of water added to the distillation zone to distill off the unreacted cymene components as an azeotropic mixture with water, and isolating and recovering the cresol component, the distillation being conducted so that

(i) the amount of unreacted cymene components in the crude cresol-containing composition is adjusted to 5–25% by weight of the composition after adjustment by distilling off a part of the unreacted cymenes and the water content of said cresol-containing composition is adjusted to 0.17–1.5 times by weight of the total cresol components in the composition by adding water thereto before the composition is supplied to the distillation zone; and

(ii) in said distillation zone, the cresol component containing ortho-cresol at a higher concentration than that in the supplied crude cresol-containing composition is distilled off as an overhead product of the distillation zone in the form of an azeotropic mixture with the unreacted cymene components and water, whereby the cresol component composed of more concentrated meta- and para-cresols with a conspicuously reduced ortho-cresol content is isolated and recovered.

4,323,433

ANODIZING PROCESS EMPLOYING ADJUSTABLE SHIELD FOR SUSPENDED CATHODE

David M. Loch, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 22, 1980, Ser. No. 189,089
Int. Cl.[3] C25D *11/02, 17/00*
U.S. Cl. 204—56 R 5 Claims

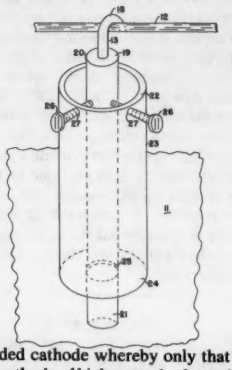
1. In an anodizing process utilizing an anodizing bath, an anode and a suspended cathode, the improvement comprising positioning for said suspended cathode an electrically nonconductive casing having an upper end, a lower end, side walls and a bottom opening;

said side walls being annularly spaced from said suspended cathode;

said casing having a bottom wall having a perimeter connected to said side walls and having a central opening which constitutes the said bottom opening of the casing;

said bottom opening receiving the bottom end of a suspended cathode, the inner surface of said side walls being annularly spaced from the said suspended cathode; and

securing means for supporting the said casing relative to the



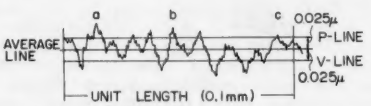
said suspended cathode whereby only that portion of the suspended cathode which extends through the said bottom opening is in effective electrolytic communication with the said anodizing bath.

4,323,434

PROCESS FOR ELECTROLYSIS OF ALKALI CHLORIDE

Mitsuo Yoshida; Yoshinori Masuda, and Akio Kashiwada, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 15, 1980, Ser. No. 121,911
Claims priority, application Japan, Feb. 16, 1979, 54-16070
Int. Cl.[3] C25B *1/34, 13/08*
U.S. Cl. 204—98 6 Claims



1. In a process for electrolysis of an alkali chloride which comprises carrying out electrolysis of an alkali chloride in an electrolytic cell divded by a cation exchange membrane into an anode compartment and a cathode compartment to produce an alkali hydroxide, the improvement which comprises using as said cation exchange membrane a homogeneous cation exchange membrane having at least one roughened surface, said roughened surface having a concavo-convex structure such that there are at least 20 concavo-convex portions with a roughness of 0.05 micron or more per unit length of 1 mm, said roughness being measured by a stylus method using a pick-up having a shape of 13 μm R at the tip of the stylus and a measuring force of 0.07 g and a wavelength cut-off value of 0.032 mm [the maximum height thereof is at least 0.05 micron], said membrane being assembled in the electrolytic cell with at least one roughened surface facing toward the cathode side of the cell.

4,323,435

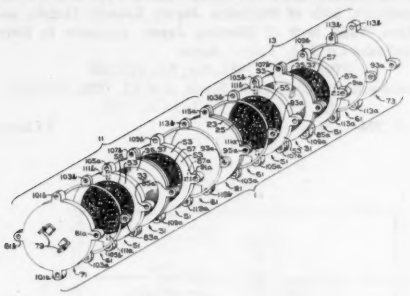
METHOD OF OPERATING A SOLID POLYMER ELECTROLYTE CHLOR-ALKALI CELL

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 15,529, Feb. 27, 1979, Pat. No. 4,250,013. This application Sep. 10, 1980, Ser. No. 185,657
Int. Cl.[3] C25B *1/34, 9/00, 13/08*
U.S. Cl. 204—98 4 Claims

1. In a method of electrolysis comprising feeding aqueous alkali metal chloride brine to an electrolytic cell having an

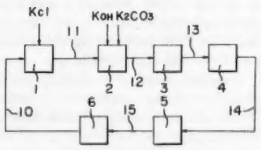
anolyte compartment separated from a catholyte compartment by a solid polymer electrolyte, said solid polymer electrolyte comprising a fluorinated permionic membrane having carboxylic acid groups as the ion exchange groups, an anodic electrocatalyst on the anodic surface thereof and a cathodic electrocatalyst on the cathodic surface thereof; imposing an electrical potential across the solid polymer electrolyte; and withdrawing chlorine from the anolyte compartment and alkali metal hydroxide from the catholyte compartment; the improvement comprising applying a rectified half wave alternating electrical current of 100 to about 400 cycles per second, through said solid polymer electrolyte.



4,323,436
PURIFICATION OF AQUEOUS SOLUTION OF POTASSIUM CHLORIDE

Eiji Itoi, Shikawatashi; Takashi Nakayama, Nishinomiya; Makoto Nakao, Yokohama, and Yukio Matsumura, Iakatsuki, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,745
Claims priority, application Japan, Jan. 10, 1980, 55-866
Int. Cl.³ C25B *1/46*
U.S. Cl. 204—98 **5 Claims**



1. In a purification of an aqueous solution of potassium chloride which is used for producing potassium hydroxide by an electrolysis in an electrolytic cell using a cation exchange membrane, an improvement characterized by incorporating an oxidizing reagent to remove additives as an anticaking reagent.

4,323,437
TREATMENT OF BRINE

Paul R. Mucenieks, Lawrenceville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

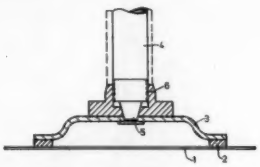
Filed Feb. 9, 1981, Ser. No. 232,602
Int. Cl.³ C25B *1/34*
U.S. Cl. 204—98 **12 Claims**

1. The process of electrolyzing sodium chloride brine to produce chlorine and caustic soda using a brine which contains oxidizable material susceptible to oxidation during said electrolysis, said oxidizable material comprising hydrogen sulfide and ammonia, wherein the improvement comprises oxidizing said oxidizable material in the brine by means of hypochlorite ions prior to electrolysis of the brine.

4,323,438
ANODE FOR ALKALI METAL CHLORIDE ELECTROLYSIS

Lothar Sesterhenn, Dormagen, and Milorad Tomic, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 21, 1980, Ser. No. 132,564
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2914414
Int. Cl.³ C25B *1/26, 1/42, 11/03, 11/10*
U.S. Cl. 204—128 **4 Claims**

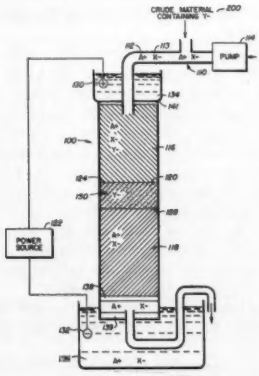


1. In an anode of a cell for alkali metal chloride electrolysis by the amalgam method and comprising a grid-like or net-like level titanium anode surface, optionally current distributing rails, a bridge acting as a primary conducting rail and at least one copper bolt as a current supply means, the improvement wherein the copper bolt has a screw thread in its lower region and below the screw thread is conical with a taper of from about 1:5 to 1:15, the bridge having a threaded passage for receiving the conical portion of the copper bolt, the copper bolt and bridge being screwed together in a force- and form-locking manner.

4,323,439
METHOD AND APPARATUS FOR DYNAMIC EQUILIBRIUM ELECTROPHORESIS

Patrick H. O'Farrell, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 31, 1979, Ser. No. 109,003
Int. Cl.³ B01D *57/02*
U.S. Cl. 204—180 G **26 Claims**



1. A method of segregating at least one species of desired ions in a separation chamber having longitudinally varying separation characteristics comprising the steps of:
introducing said ions into said chamber;
imparting said ions with a movement in a first direction by flowing a carrier fluid through said chamber; and
applying an electric field across said chanber to simulta-

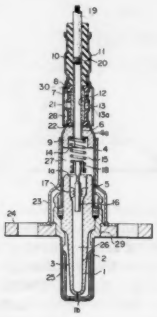
neously electrophorese said ions in a second direction counter to said first direction to segregate each of said species in an equilibrium zone within the chamber.

4,323,440

OXYGEN SENSOR WITH PROTECTIVE SHIELD AND POROUS AIR FILTER

Takao Akatsuka, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 27, 1980, Ser. No. 201,237
Claims priority, application Japan, Mar. 25, 1980, 55-38428
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—195 S **6 Claims**



1. An oxygen sensor, comprising:

(a) an electrolytic body, made of a solid electrolyte material, and formed as a tube with an open end and a closed end;

an internal electrode located on the interior surface of the tubular electrolytic body;

(c) an external electrode located on the exterior surface of the tubular electrolytic body;

(d) a tubular housing airtightly connected around the outer circumference of the open end of the tubular electrolytic body, and defining within it an internal space to which the internal electrode is exposed, and formed with a side hole;

(e) an electrically conducting tube member, located within the tubular housing and substantially coaxial therewith, and formed with a side hole opposing the side hole in the tubular housing;

(f) a blocking member, comprising (fa) a tube formed of water repellent porous material and (fb) a tube made of an elastomeric rubber-like material and formed with a side hole, one of these tubes being within the other, said blocking member being fitted tightly over the electrically conducting tube member and fitting tightly inside the tubular housing and interrupting communication of said internal space within the tubular housing, via the space between the tubular housing and the electrically conducting tube member, to the outside, with said side hole in the tube which is made of an elastomeric rubber-like material corresponding to the side holes in the tubular housing and in the electrically conducting tube member;

(g) a means for electrically connecting the internal electrode with the end of the electrically conducting tube member closest thereto;

(h) a lead wire connected to the other end of the electrically conducting tube member and leading to the outside of the sensor, communication between said internal space within the tubular housing via the part of the inside of the electrically conducting tube member closer to said other end thereof than said blocking member to the outside being interrupted; and

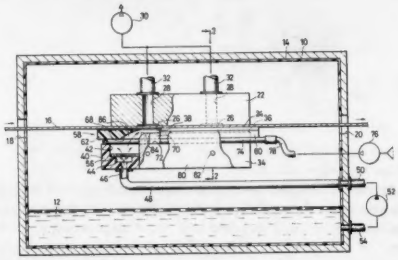
(i) a protective shield located over the outside of the said hole in the housing, which does not interrupt communication between said side hole and the atmosphere, but which shields said side hole from direct exposure to the exterior.

4,323,441

APPARATUS FOR ELECTROPLATING STRIP MATERIAL WITHOUT CURRENT LEAKAGE

Glenn R. Schaer, Columbus, Ohio; Tasuku Touyama; Teruaki Yamamoto, both of Shizuoka, Japan; Keisuke Honda, and Tatsuo Wada, both of Shimizu, Japan, assignors to Koito Seisakusho Co. Ltd., Tokyo, Japan

Filed Jan. 7, 1981, Ser. No. 223,208
Claims priority, application Japan, Jan. 12, 1980, 55-2242
Int. Cl.³ C25D *5/02, 5/08, 7/06*
U.S. Cl. 204—224 R **5 Claims**



1. An apparatus for electroplating a strip of electrically conductive material being fed through the apparatus in a predetermined direction, comprising:

(a) a hollow vessel for receiving an electroplating solution containing a metal to be electrodeposited;

(b) a cathode mounted in the vessel and having a bottom surface disposed horizontally, the conductive strip being fed in sliding contact with the bottom surface of the cathode and being thereby made cathodic;

(c) an insoluble anode mounted under the cathode, there being an interelectrode gap between the insoluble anode and the conductive strip traveling under the cathode;

(d) inlet means in said vessel defining a solution inlet from which the electroplating solution is fed into the interelectrode gap so as to flow turbulently therethrough in the predetermined traveling direction of the conductive strip;

(e) turbulence creating means for making constant in the transverse direction of the conductive strip the degree of turbulence of the electroplating solution flowing through the interelectrode gap;

(f) a pair of sealing bars of electrically insulating material for sealing the opposite sides of the interelectrode gap against the outflow of the electroplating solution; and,

(g) a shield block bridging the pair of sealing bars and molded integral therewith, the shield block being disposed over the inlet means so as to shield the conductive strip traveling over the shield block from premature deposition of the metal due to current leakage.

4,323,442

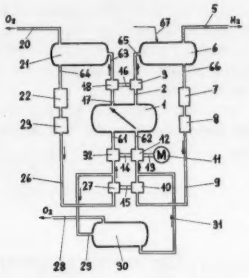
ELECTROLYSIS INSTALLATION FOR THE PRODUCTION OF GAS

Patrice Lantin, Givry, and Gerard Pere, Le Breuil, both of France, assignors to Creusot-Loire, Paris, France

Filed Jul. 2, 1980, Ser. No. 165,368
Claims priority, application France, Jul. 5, 1979, 79 17929
Int. Cl.³ C25B *15/08, 9/00*
U.S. Cl. 204—237 **8 Claims**

1. An electrolysis installation having separate anolyte and catholyte flow circuits and gas outlets, and whereby degassed electrolyte is recycled by means of pumps to an electrolyzer and comprising an electrolyzer equipped at least partially with

diaphragms separating the anolyte and catholyte into separate compartments and which are permeable to liquids and impermeable to gases; and means based on the creation of differences in flow enabling a partial transfer of electrolyte to be effected in the electrolyzer, through said diaphragms, from each catholyte compartment to the corresponding anolyte compartment, in such a manner as to preserve similar electrolyte densities for



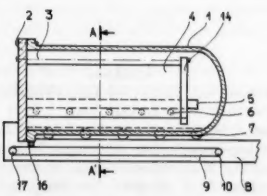
each of the anolyte and catholyte flow circuits; said means comprising, downstream of the electrolyzer, an anolyte flow control device coupled to a catholyte flow control device, said devices being dimensioned to impose an anolyte-catholyte flow ratio greater than that existing at the inlets of the recycled electrolyte to the electrolyzer, of the amount necessary to effect, by suction, said transfer through said diaphragms.

4,323,443

ELECTROLYZER HAVING A HORIZONTAL TUBULAR ENCLOSURE

Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France

Filed Feb. 1, 1980, Ser. No. 117,653
Claims priority, application France, Jul. 2, 1979, 79 03797
Int. Cl.³ C25B 9/00
U.S. Cl. 204—253 **2 Claims**



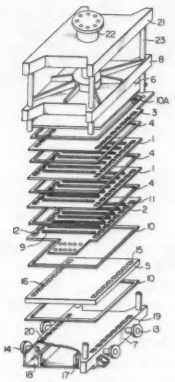
1. An electrolyzer comprising a stack of elemental electrolytic cells, an enclosure surrounding said stack and consisting of a vertical base attached to said stack and a movable horizontal tubular body, a horizontal base supporting said tubular body and attached to said vertical base, and a device mounted on the exterior of said tubular body so as to provide longitudinal rolling movement of said tubular body on said horizontal base.

4,323,444

FILTER PRESS-TYPE ELECTROLYTIC CELL

Chikayuki Kawamura; Toshiro Isoya, and Kazunori Yamataka, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 28, 1980, Ser. No. 173,139
Claims priority, application Japan, Jul. 31, 1979, 54/97817
Int. Cl.³ C25B 9/00, 11/10, 15/08
U.S. Cl. 204—269 **11 Claims**



1. A filter press-type electrolytic cell comprising parallel electrode plates with inflow holes and outflow holes for allowing an electrolytic solution to be passed, gaskets being placed between the electrode plates to seal their peripheral edges, spacers being put on one side of the electrode plates to keep a given distance therebetween, and a pair of metallic press heads being provided at the both ends of the group of the electrode plates to tighten them, wherein supply and discharge of the electrolytic solution to and from spaces between the electrode plates is conducted through inflow holes and outflow holes of the individual electrode plates, wherein an improvement comprises one or more inlets and one or more outlets for the electrolytic solution being provided on only one of the press heads and communicated with the inflow holes and the outflow holes of the individual electrode plates, respectively, and an insulating plate of non-electroconductive material having a thickness of 4–60 mm being placed between the press head with the inlet and the outlet and the nearest electrode plate thereto, the insulating plate having inflow holes and outflow holes which communicate with the inflow holes and the outflow holes of the individual electrode plates, respectively, and the edge parts of the holes of adjacent electrode plate and the adjacent press head are prevented from inwardly protruding from the edge of holes of the insulating plate in a state of stacking the insulating plate and the adjacent electrode plate and the adjacent press head one upon another in positions at normal operation.

4,323,445
APPARATUS FOR ELECTROKINETICALLY SEPARATING DRILLING MUD

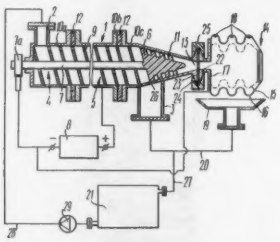
Stanislav A. Alekhin, Chilanzar, kvartal 24, dom 53, kv. 89; Eduard B. Kuznetsov, Chilanzar, Sektor E, dom 5, kv. 33; Vitold M. Bakhir, proezo Gaidara, 7, kv. 17; Vladimir I. Klimenko, Chilanzar, kvartal 23, dom 3, kv. 37, and Jury G. Zadorozhny, Chilanzar, kvartal 2, dom 59, kv. 12, all of Tashkent, U.S.S.R.

PCT No. PCT/SU80/00031, § 371 Date Nov. 26, 1980, § 102(e) Date Nov. 25, 1980, PCT Pub. No. WO80/02045, PCT Pub. Date Oct. 2, 1980

PCT Filed Feb. 27, 1980, Ser. No. 224,547

Int. Cl.[3] **B01D** *13/02;* **E21B** *21/06;* **B01D** *43/00;* **B03C** *5/00*

U.S. Cl. 204—300 R **6 Claims**



1. An apparatus for electrokinetically separating drilling mud into liquid and solid phases, comprising a casing having an inlet for drilling mud and outlets for separated phases thereof and accommodating electrodes connected to the negative terminal and to the positive terminal respectively, of a d-c source, characterized in that the electrode connected to the negative terminal of the d-c source (**8**) comprises a conveyor screw (**4**) having a cylindrical portion (**5**) and an adjacent conical portion (**6**), the screw being installed in the casing (**1**) which forms the electrode connected to the positive terminal of the d-c source (**8**) and has respective cylindrical (**10***a*, **10***b*, **10***c*) and conical (**11**) portions, the outlet (**13**) for solid phase of drilling mud being provided at the end of the conical portion (**11**) of the casing (**1**), and in that there is provided a receptacle (**14**) for collecting solid phase of drilling mud communicating with the outlet (**13**) for solid phase of drilling mud provided in the casing (**1**).

4,323,446
MULTI-ZONE COAL CONVERSION PROCESS USING PARTICULATE CARRIER MATERIAL

Michael C. Chervenak, Pennington; Edwin S. Johanson, Princeton, and Marvin S. Rakow, East Brunswick, all of N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Aug. 30, 1979, Ser. No. 71,215

Int. Cl.[3] **C10G** *1/00;* **C10J** *3/00*

U.S. Cl. 208—8 R **14 Claims**

1. A multi-zone coal gasification process for producing fuel gas and distillable liquid products, comprising the steps:

(a) injecting particulate coal into a pressurized upper fluidized bed devolatilization zone maintained at 900° to 1500° F. temperature range and containing an adsorptive particulate carrier material suitable for deposition of coal tars and coke thereon and on which coke deposits while reacting with an upflowing reducing gas;

(b) passing the carrier material coated with coke plus unconverted coal solids (char) downward through an intermediate stripping zone into a lower fluidized bed gasification zone;

(c) injecting steam and oxygen-containing gas into the lower gasification zone to maintain it at 700°–2000° F. temperature range for combustion of the unconverted coal solids and coke deposited on the carrier material and to produce said reducing gas and ash;

(d) passing said reducing gas upwardly successively through said stripping zone and through said upper bed to fluidize same;

(e) transferring the clean hot particulate carrier solids from the lower gasification zone upward through a riser conduit into the upper devolatilization zone using a transport gas;

(f) passing effluent gas from the upper devolatilization zone through a primary separation step for removal of solids, which are returned to the lower fluidized bed;

(g) withdrawing effluent gas and distillable liquid products from the upper zone; and

(h) further separating principally ash and unconverted coal solids from the effluent gas and withdrawing them from the process.

4,323,447
COAL LIQUEFACTION PROCESS EMPLOYING OCTAHYDROPHENANTHRENE-ENRICHED SOLVENT

Shirley C. Tsai, and Howard G. McIlvried, III, both of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Feb. 5, 1980, Ser. No. 118,859

Int. Cl.[3] **C10G** *1/00, 1/06*

U.S. Cl. 208—8 LE **19 Claims**

1. A process for the conversion of coal to a liquid fuel product, which comprises contacting said coal with hydrogen and a coal-derived recycle solvent in a coal liquefaction zone, said recycle solvent containing OHP, THP and P, said OHP and THP being present in a ratio of OHP/THP greater than 0.4 and less than 15, said OHP being present in an amount of at least 5 weight percent based on the total weight of said recycle solvent, withdrawing reactor effluent comprising liquid from said coal liquefaction zone, passing a portion of the liquid produced in said coal liquefaction zone having a boiling range between about 200° and about 500° C. and containing OHP and THP in a ratio of OHP/THP below 0.4 with hydrogen to a hydrogenation zone, and hydrogenating said liquid in the presence of a supported catalyst consisting essentially of Group VIB and Group VIII metals under hydrogenation conditions including a temperature between about 260° and about 427° C. to provide an OHP-enriched solvent containing OHP and THP in a ratio of OHP/THP greater than 0.4 and below 15, and at least 1 weight percent THP, and recycling the OHP-enriched solvent for contact with said feed coal, and recovering a portion of the liquid produced in said coal liquefaction zone as liquid fuel product.

4,323,448
PROCESS FOR ACTIVATING TREATMENT OF CRUDE OIL

Karl Entzmann, St. Kathrein am Hauenstein, Austria, assignor to Simmering-Graz-Pauker Aktiengesellschaft fur Maschinen-, Kessel-und Waggonbau, Vienna, Austria

Filed Mar. 18, 1980, Ser. No. 131,426

Claims priority, application Austria, Mar. 19, 1979, 2039/79

Int. Cl.[3] **C10G** *7/00, 71/00*

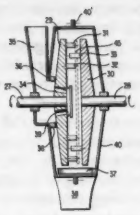
U.S. Cl. 208—85 **12 Claims**

1. A process for mechanochemically activating a liquid hydrocarbon comprising the steps of:

passing said hydrocarbon to a disintegrator comprising a pair of counter-rotable disks having alternate concentric rows of beating pins;

subjecting said hydrocarbon to intense mechanical beating

by contacting said hydrocarbon with said beating pins, whereby said hydrocarbon is subjected to a statistical



average of between about 3 to 12 beats during a period between about 0.001 to 0.01 seconds; and

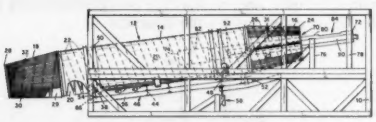
recovering a mechanochemically activated hydrocarbon.

4,323,449

METHOD AND APPARATUS FOR BENEFICIATING COAL

Robert A. Pelletier, Rte. 15, Moreland Dr., Kingsport, Tenn. 37660

Filed Nov. 14, 1980, Ser. No. 206,961
Int. Cl.³ B03B *5/02, 5/30*
U.S. Cl. 209—17 **11 Claims**



1. An apparatus for the beneficiation of a mixture including coal and a second material having a greater density than coal comprising:

a frame,

an elongated, hollow, generally cylindrical barrel member,

said barrel member including:

an imperforate central section,

a foraminous inwardly directed, frustoconical end section connected to each end of said central section,

a spiral flight attached to the interior surface of the central section of said barrel and at least one of said frustoconical sections,

means for mounting said barrel for rotation on said frame with its longitudinal axis disposed at an acute angle to the horizontal with a frustoconical section having a spiral flight being elevated relative to the other frustoconical section,

means for varying the angle of said barrel,

means for rotating said barrel about its longitudinal axis, a source of liquid medium of predetermined density,

a source of said mixture, means for depositing said liquid medium from said medium source at a location within said central section,

means for continuously supplying said mixture to a location within said central section,

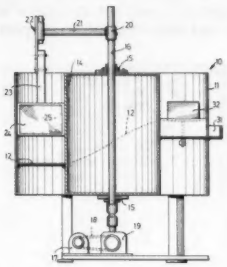
whereby coal concentrate passes out the lower end of said barrel and the second material passes out the upper end of said barrel.

4,323,450

APPARATUS FOR SEPARATING A SOLID OR VISCOUS LIQUID COMPONENT FROM A MIXTURE

Geoffrey C. Arthur, Coventry, England, assignor to Abrasive Developments Limited, Henley in Arden, England

Filed Feb. 4, 1980, Ser. No. 118,188
Claims priority, application United Kingdom, Feb. 17, 1979, 5658/79
Int. Cl.³ B01D *21/24*
U.S. Cl. 210—11 S **7 Claims**



1. Apparatus for separating the components of a mixture, the mixture comprising a solid or viscous liquid component and a readily flowable liquid component, the flowable liquid component having a specific gravity which is only slightly greater than that of the solid or viscous liquid component, the apparatus comprising:

a tank having a closed bottom and a top;

inlet means for supplying the mixture to the tank;

a separation ramp located within the tank and being inclined upwardly between the bottom and the top of the tank and above the level of the mixture to be received in the tank;

a first aperture means in communication with the ramp for egress of the readily flowable liquid from the tank, closure means for the first aperture means, biasing means for biasing the closure means open, the biasing means including means for imparting a force to the closure means to maintain the first aperture means open to receive the flowable liquid component and to enable the first aperture means to close by flow of the solid or viscous liquid component past the closure means as the mixture flows upwardly on the ramp along a mixture flow path;

second aperture means in communication with the ramp and positioned downstream from the first aperture means along the mixture flow path;

skimmer means for skimming through the mixture at least adjacent the ramp and for skimming over the ramp and thereby skimming the mixture towards the first and second aperture means;

means for rotating the skimmer means through the mixture at a speed such that the skimmer means drives the mixture with the readily flowable liquid component preceding the solid or liquid viscous component up the ramp and through the first aperture means and with the solid or viscous liquid component following behind and closing the first aperture means, and with the solid or viscous liquid component directed past the closure means towards the second aperture means.

4,323,451

ARRAY OF FILTER ELEMENTS

Tadashi Hagihara, 4-1, 5-chome, Minami Nagasaki, Toshima-ku, Toyko, Japan

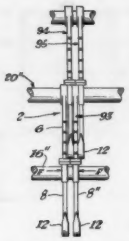
Filed May 30, 1978, Ser. No. 910,361
Int. Cl.³ B01D *33/32*
U.S. Cl. 210—160 **11 Claims**

10. In an array of staggeringly interconnected thin filter elements in a plurality of rows held together by a transverse

clamping force on a plurality of parallel spaced apart support shafts, the first row of filter elements that are supported on a first forward shaft and a second rearward shaft with an adjacent forward row and rearward row of like filter elements also supported by two adjacent shafts, the rearward shaft of the adjacent forward row is the same shaft as said first forward shaft, the forward shaft of the adjacent rearward row is the same shaft as said second rearward shaft, filter elements comprising:

filter elements,

each of said filter elements including an arm with two hubs located in said arm, each hub includes a bore for connecting each of said filter elements to support shafts,



separator means for separating adjacent filter elements that are similarly held on the same two shafts, said separator means positioned adjacent and about at least a portion of one of said hubs, said separator means including projecting means for projecting outward from at least one side of each of said filter elements for distal contact with at least one of the adjacent filter elements that are similarly held on the same two shafts,

said separator means having at least one surface area balancing means for balancing the transverse clamping force holding a plurality of filter elements in each row that are similarly held on the same two shafts.

4,323,452

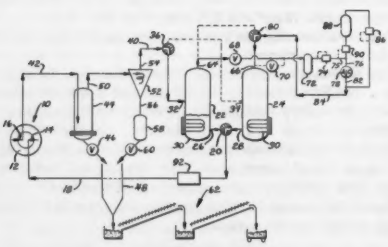
PUMPLESS FLOW SYSTEM FOR A CORROSIVE LIQUID

Marion J. Witzenburg, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 108,910, Nov. 1, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 219,310

Int. Cl.³ B01D *21/26, 53/14*

U.S. Cl. 210—188 **9 Claims**



1. A closed loop high pressure fluid flow system for transporting a mixture of a highly corrosive liquid and a particulate material and separating the latter from the former while recovering the corrosive liquid and not requiring mechanical pumps comprising:

a source (78,82) of high pressure gas under pressure;

first and second corrosive liquid reservoirs (22,24) connected in parallel (64,66,80,84) to said source, said source comprising a compressor (78) having an outlet (82) connectable to one or the other, but not both concurrently, of said reservoirs and an inlet (76) connectable to one or the other, but not both concurrently, of said reservoirs, and specifically the reservoir not then connected to said outlet, and gas supply regulating means comprising a gas storage tank, a low pressure regulator connecting the gas storage tank to said compressor inlet, and a high pressure regulator connecting the gas storage tank to said compressor outlet;

means (20) for connecting one or the other, but not both concurrently, of said reservoirs to a point of use (10) of the corrosive liquid and specifically, for connecting the reservoir receiving pressurized gas to said point of use;

means (44,52) for receiving a mixture of the corrosive liquid, after use, and particulate material and for separating the mixture into its components of particulate material and corrosive liquid; and

means (36) for conveying the separated corrosive liquid to one or the other, but not both concurrently, of the reservoirs, and specifically the reservoir not then receiving pressurized gas from the source.

4,323,453

TUBE SHEETS FOR PERMEATORS

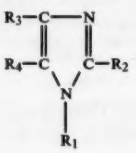
Anthony Zampini, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 109,428, Jan. 3, 1980, abandoned. This application Nov. 25, 1980, Ser. No. 209,806

Int. Cl.³ B01D *31/00, 13/00;* **B29C** *6/04;* **B29F** *1/10*

U.S. Cl. 210—321.1 **32 Claims**

1. A tube sheet having a plurality of hollow fiber membranes suitable for fluid separations embedded therein, said tube sheet being adapted to be positioned in a fluid tight relationship within a permeator and said tube sheet comprising a cured epoxy resin of a liquid resin comprising polyglycidyl resin and imidazole curing agent having the structure



wherein R_1 is hydrogen, alkyl of 1 to about 12 carbon atoms, lower acyl or mono or bicyclic aryl or aralkyl of 6 to about 15 carbon atoms and R_2, R_3 and R_4 are hydrogen, halogen, hydroxy, nitro, alkoxy of 1 to about 6 carbon atoms, alkyl of 1 to about 12 carbon atoms, lower acyl, or mono or bicyclic aryl or aralkyl of 6 to about 15 carbon atoms, said imidazole curing agent being provided in an amount between about 2 to 40 percent of the amount required for complete reaction through one ring nitrogen with the epoxy moieties of the liquid resin on a stoichiometric basis.

4,323,454

TUBE SHEETS FOR PERMEATORS

Alfred K. Fritzsche, Cary; Harry P. Holladay, and Maurice L. Woodcock, both of Raleigh, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 109,425, Jan. 3, 1980, abandoned. This application Nov. 25, 1980, Ser. No. 209,807

Int. Cl.³ B01D *31/00, 13/00;* **B29C** *6/04;* **B29F** *1/10*

U.S. Cl. 210—321.1 **71 Claims**

1. A tube sheet having a plurality of hollow fiber membranes suitable for fluid separations embedded therein, said tube sheet being adapted to be positioned in a fluid tight relationship within a permeator and said tube sheet comprising a cured, solidified resinous composition of a liquid resinous composition, said liquid reinous composition comprising

a. resin containing a major amount by weight of polyglycidyl resin having a viscosity of about 1000 to 30,000 centipoises at 25° C., said resin having a viscosity of about 500 to 12,000 centipoises at 25° C.;
b. curing agent composition in an amount sufficient to consume at least about 90 percent of the glycidyl groups in the liquid resinous composition; and
c. particulate filler having a density of about 1 to 10 grams per cubic centimeter at 25° C., an average maximum particle size of about 1.5 to 150 microns, and a surface area of less than about 5 square meters per gram of filler, said filler comprising about 5 to less than about 35 percent by volume of the liquid resinous composition

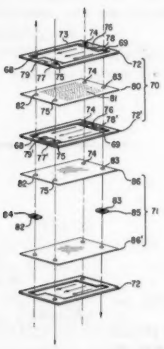
wherein the liquid resinous composition has a viscosity of about 1000 to 10,000 centipoises at 25° C.

4,323,455

COMPACT TYPE FLUID TREATMENT APPARATUS

Yoshinobu Tanaka; Koichi Ogawa, and Minoru Hioka, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 21,765, Mar. 19, 1979, abandoned. This application Aug. 19, 1980, Ser. No. 179,486
Claims priority, application Japan, Mar. 28, 1978, 53-36285; Nov. 15, 1978, 53-141407
Int. Cl.³ B01D *13/00*; C02F *1/44*
U.S. Cl. 210—321.2 **18 Claims**



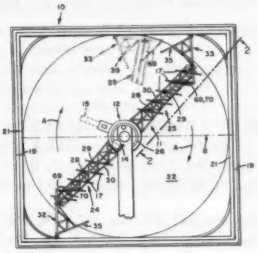
1. A fluid treatment apparatus comprising: a stack assembly composed of two kinds of cells disposed in such order of arrangement that the adjacent cells are different in kind from each other; a first cell positioned in a cell plane and including a first fluid distribution means having inlet and outlet ports for a first fluid and the membranes lying on either side of said means; a second cell positioned in said cell plane and including a second fluid distribution member having inlet and outlet ports for a second fluid and comprising paired members having a plurality of grooves on one surface thereof that form independent tunnel-like fluid paths between the membrane support sheet and a respective one of the paired members, said membrane support sheet being 5–500μ thick and provided with a large number of projections on either side of the central portion thereof, said projections being 50–500μ thick, and said pair of grooved members being arranged so that the grooved surfaces are face-to-face with each other, interposing said membrane support sheet therebetween; and, so that each of said distribution members may introduce a respective fluid separately through said stack assembly and so that said first fluid may be distributed between a pair of membranes composing the first cell as well as the second fluid between the second cell and an adjacent membrane, the fluid manifolds of all of said cells are adapted to communicate with said inlet and outlet ports for said first and second fluids and are arranged so as to perform substantially uniform diffusion exchange of substances between said first and second fluids; wherein said first and second fluid distribution members do not overlap one another in said cell plane.

4,323,456

CORNER SWEEP MECHANISM FOR SQUARE SETTLING TANK

John Olear, Cheshire, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Sep. 2, 1980, Ser. No. 183,106
Int. Cl.³ B01D *21/18*
U.S. Cl. 210—529 **6 Claims**



1. In a square-shaped settling tank for separating solids from a solids-liquid suspension, a feed supply inlet, a first outlet means at the top of the tank for discharging supernatant liquids separated from solids settled on the tank bottom, a second outlet means at the bottom of the tank for discharging said sludge, a rotary rake structure having rake arms effective to move solids over said tank bottom to said second outlet means and a supplemental corner sweep mechanism secured to said rotary rake structure for sweeping the corner areas of said tank bottom, said supplemental corner sweep rake mechanism comprising:

a. a frame of triangular configuration suspended from and pivotally mounted to the outer end of said rotary rake structure with a corner sweep arm forming the base of said triangular frame and a pivot arm and a support arm for said pivot arm completing the sides of said triangular frame,
b. said pivot arm and said support arm comprised of elongated watertight hollow members to provide buoyancy to said frame during movement thereof through a solids-liquid suspension over said tank bottom.
c. guide means provided at one end of said pivot arm,
d. a control arm connected to said pivot arm for controlling movement of said pivot arm, and
e. a tension spring means interconnected at one end to said control arm and at the opposite end to said rotary rake structure to urge said guide means into constant contact with the inner wall surface of said tank and operable to move said pivot arm and said corner sweep arm into the corner areas of said tank bottom during rotation of said rotary rake structure.

4,323,457

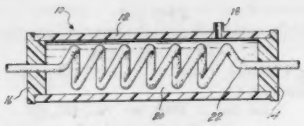
ARTIFICIAL ENDOCRINE PANCREAS

Anthony M. Sun, and Wolf J. Parisius, both of Willowdale, Canada, assignors to Connaught Laboratories Limited, Willowdale, Canada

Filed Mar. 24, 1977, Ser. No. 781,001
Claims priority, application Canada, Mar. 21, 1977, 274354
Int. Cl.³ B01D *31/00, 13/00*
U.S. Cl. 210—645 **12 Claims**

9. A process for treating a body fluid comprising: placing in a container defining an enclosed chamber pancreatic islet cells;

and passing body fluid through one or more hollow fibres extending in said chamber, each said fibre having a porosity



allowing substances of molecular weight less than 100,000 Daltons to diffuse and to thereby treat said body fluid.

4,323,458

PROCESS FOR REMOVING HEAVY-METAL IONS FROM AQUEOUS SOLUTION

Hiroyuki Uejima, Nara; Masahide Hirai, Kyoto, and Tsutomu Sakaida, Uji, all of Japan, assignors to Unitika Ltd., Hyogo, Japan

Division of Ser. No. 941,355, Sep. 11, 1978, Pat. No. 4,266,045. This application Aug. 20, 1980, Ser. No. 180,056
Claims priority, application Japan, Sep. 12, 1977, 52/110099
Int. Cl.³ C02F *1/28*
U.S. Cl. 210—688 **16 Claims**

1. A method for adsorptive treatment, which comprises contacting an aqueous solution containing a heavy metal ion and having a pH of about 7 to 13 with an etherified phenolic chelate resin comprising the product obtained on etherification of some or all of the phenolic hydroxyl groups of a phenolic chelate resin with an etherification agent, wherein the heavy metal is adsorbed by said phenolic chelate resin and removed from said aqueous solution.

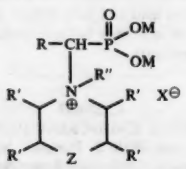
4,323,459

PROCESS OF INHIBITING SCALE FORMATION IN AQUEOUS SYSTEMS USING QUATERNARY AMMONIUM SALTS OF α-1,4-THIAZINE ALKANEPHOSPHONIC ACIDS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 932,258, Aug. 9, 1978, Pat. No. 4,259,483. This application Sep. 15, 1980, Ser. No. 187,399
Int. Cl.³ C02F *5/12, 5/14*
U.S. Cl. 210—700 **10 Claims**

1. A process of inhibiting scale formation in an aqueous solution which comprises treating said aqueous solution with an effective amount of a compound of the formula



where R and R'' are members selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl, alkaryl, aralkyl, and hydroxyphenyl and from the group consisting of alkyl, aralkyl, cycloalkyl, alkenyl, and alkynyl, respectively, R' is hydrogen or alkyl, Z is S, SO or SO_2, M is hydrogen or a salt moiety and X is a halide, acetate, sulfonate or arylsulfonate.

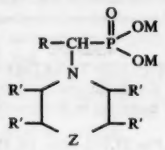
4,323,460

PROCESS OF INHIBITING SCALE FORMATION IN AQUEOUS SYSTEMS USING α-1,4-THIAZINE ALKANEPHOSPHONIC ACIDS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 932,257, Aug. 9, 1978, Pat. No. 4,264,767. This application Oct. 2, 1980, Ser. No. 193,222
Int. Cl.³ C02F *5/12, 5/14*
U.S. Cl. 210—700 **8 Claims**

1. A process of inhibiting scale formation in an aqueous solution which comprises treating said aqueous solution with an effective amount of a compound of the formula



where R is a member selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl, alkaryl, aralkyl and hydroxyphenyl, and R' is hydrogen or alkyl, Z is S, SO or SO_2, and M is a hydrogen or a salt moiety.

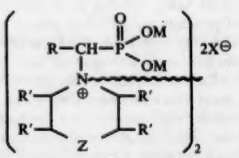
4,323,461

PROCESS OF INHIBITING SCALE FORMATION IN AQUEOUS SYSTEMS USING DI-QUATERNARY AMMONIUM SALTS OF α-1,4-THIAZINE ALKANEPHOSPHONIC ACIDS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 932,259, Aug. 9, 1978, Pat. No. 4,264,768. This application Oct. 14, 1980, Ser. No. 197,055
Int. Cl.³ C02F *5/12, 5/14*
U.S. Cl. 210—700 **5 Claims**

1. A process of inhibiting scale formation in an aqueous solution which comprises treating said aqueous solution with an effective amount of a compound having the formula



where R is alkyl, alkenyl, cycloalkyl, aryl, alkaryl, aralkyl or hydroxyphenyl, R' is hydrogen or alkyl, Z is S, SO or SO_2, M is hydrogen or a salt moiety, is a bridging group selected from alkylene, aralkylene, alkaralkylene, alkylene- or polyalkylene-ether, alkenylene or alkynylene and X is a halide.

4,323,462

PROCESS FOR PURIFYING WATER CONTAINING FLUORIDE ION

Stanley Bruckenstein, Williamsville, N.Y., assignor to Andco Industries, Inc., Buffalo, N.Y.

Division of Ser. No. 11,512, Feb. 12, 1979, Pat. No. 4,226,710, which is a continuation-in-part of Ser. No. 761,685, Jan. 24, 1977, Pat. No. 4,145,282. This application Jul. 24, 1980, Ser. No. 173,324

The portion of the term of this patent subsequent to Mar. 20, 1996, has been disclaimed.

Int. Cl.[3] C02F *1/52*

U.S. Cl. 210—714 2 Claims

1. A continuous process for purifying water containing fluoride which comprises:

(a) continuously adding sufficient calcium composition to a stream of water to provide at least five moles of available calcium in said water for each mole of fluoride in said water;

(b) continuously adding sufficient phosphate composition to said stream, said phosphate composition being selected to provide a pH in the water of below about 11.5 after its addition;

(c) subsequent to adding said phosphate, upwardly adjusting and maintaining the pH of the water to above 6.0 and below 11.5 with a base;

(d) slurrying a seeding composition selected from the group consisting of fluorapatite, calcium fluoride and mixtures thereof into said stream; and

(e) permitting a precipitate to form which contains essentially all fluoride which was present in the water.

4,323,463

SECONDARY RECOVERY PROCESS

Abraham Morduchowitz, Monsey, N.Y., assignor to Texaco Inc., White Plains, N.Y.

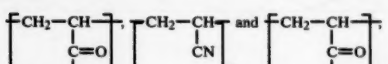
Filed Jun. 11, 1980, Ser. No. 158,657

Int. Cl.[3] E21B *43/22*

U.S. Cl. 252—8.55 D 11 Claims

1. A process for recovering hydrocarbons from a subterranean, hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(a) injecting into the formation via an injection well a drive fluid comprising brine having dissolved therein about 0.01 to about 5.0 weight percent of a terpolymer water insoluble, brine soluble, having a number average molecular weight from about 10,000 to about 2,000,000 and comprising recurring units of:



wherein x, y and z represent the weight percent of the respective units in the said terpolymer and x ranges from about 50 to about 60 weight percent, y ranges from about 20 to about 30 weight percent and z ranges from about 10 to about 20 weight percent and wherein M is the radical

$$-(CH_2CH_2O)_nH$$

wherein n is an integer of from 1 to 3 inclusive

(b) forcing the said fluid through the formation and

(c) recovering hydrocarbons through the production well.

4,323,464

PROCESS FOR PRODUCING HYDRATED IRON OXIDE HAVING SILICON AND PHOSPHORUS COMPONENT

Shinji Umeki, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1980, Ser. No. 143,512

Claims priority, application Japan, May 11, 1979, 54-57021

Int. Cl.[3] C01G *49/06*

U.S. Cl. 252—62.59 6 Claims

4. A process for producing a hydrated iron oxide powder consisting essentially of

goethite;

a silicon component in an amount of 0.05 to 10 weight %, as Si based on the iron oxide; and

a phosphorus component in an amount of 0.05 to 5 weight %, as P based on the iron oxide;

wherein silicon and phosphorus are incorporated in the crystal structure of the iron oxide;

the process comprising:

adding a base to an aqueous solution of ferrous ion;

and oxidizing the so-formed admixture, while maintaining the pH of the admixture in the range of 5.5 to 7.5;

wherein a silicate and a phosphate are present in said admixture during oxidation.

4,323,465

STABILIZED SODIUM SULFATE-HYDROGEN PEROXIDE-SODIUM CHLORIDE ADDUCT AND ALKALINE BLEACH COMPOSITION CONTAINING SAME

Gale D. Downey, Pennington, and Charles W. Lutz, Princeton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 23, 1981, Ser. No. 256,621

Int. Cl.[3] C11D *7/36*

U.S. Cl. 252—102 19 Claims

1. A $4Na_2SO_4.2H_2O_2.NaCl$ composition, having improved storage stability in alkaline formulations, comprising $4Na_2SO_4.2H_2O_2.NaCl$ having incorporated in its crystalline structure a stabilizing amount of an organic polyphosphonate compound wherein the polyphosphonate compound contains 2 or more $—PO_3—$ functions connected through their phosphorous atoms by way of an alkylene chain optionally interrupted by a nitrogen atom or containing a hydroxy substituent.

4,323,466

GERMICIDE

Janet C. Curry, Palisade, and Barbara H. Bory, Fairview, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 926,777, Jul. 21, 1978, abandoned, which is a division of Ser. No. 308,064, Nov. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 72,527, Sep. 15, 1970, abandoned. This application Aug. 11, 1980, Ser. No. 177,302

The portion of the term of this patent subsequent to Jul. 6, 1996, has been disclaimed.

Int. Cl.[3] A61L *13/00;* C11D *1/66, 3/075, 3/48*

U.S. Cl. 252—106 13 Claims

1. An antibacterial detergent composition having bactericidal properties and being effective to destroy at least 99.9% of *S. aureus* cells during a contact time of about 10–15 minutes at washing concentrations at a temperature of about 25° C. to about 40° C., comprising

(a) a 2-alkyl-2-imidazoline having an alkyl group of 9–17 carbon atoms,

(b) a bacteriostatic halogenated compound selected from the group consisting of 4',5-dibromosalicylanilide, 3,4',5-tribromosalicylanilide, and 2,4,4'-trichloro-2'-hydroxydiphenyl ether, and mixtures thereof, in a compatible detergent base, the weight ratio of (b) to (a) being from about 0.01:1 to about 2:1 by weight.

4,323,467

CONTACT LENS CLEANING, STORING AND WETTING SOLUTIONS

Cherng-Chyi Fu, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 24, 1980, Ser. No. 209,795
Int. Cl.³ C11D *1/44, 1/66, 1/722, 3/48*
U.S. Cl. 252—106 **9 Claims**

1. A contact lens cleaning, storing or wetting solution which comprises:

(a) a poly(oxyethylene)-poly(oxypropylene) substituted ethylene diamine nonionic surfactant which is present in an amount of 0.01% to 40% by weight/volume (w/v);

(b) at least one germicide which is present in an amount of 0.0005% to 0.05% (w/v);

(c) a water soluble, cellulose-derived viscosity builder which is present in an amount of 0.01% to 5.0% (w/v);

(d) at least one tonicity agent which is present in an amount of 0.4% to 1.7% (w/v);

(e) a sequestering agent which is present in an amount of 0.01% to 1.0% (w/v); and

(f) water.

4,323,468

MAKE-UP REMOVER COMPOSITION FOR THE FACE AND EYES

Jean-Francois Grollier, Paris, and Josiane Allec, Pierrefitte, both of France, assignors to L'Oreal, Paris, France

Filed May 12, 1980, Ser. No. 149,115
Claims priority, application Luxembourg, May 15, 1979, 081257
Int. Cl.³ C11D *1/72*
U.S. Cl. 252—174.17 **5 Claims**

1. A makeup removal composition comprising in an aqueous carrier a cleansing amount of a surface active agent selected from the group consisting of

(1) alkyl or hydroxyalkyl polyglucoside wherein the alkyl moiety has 11–18 carbon atoms and which has 5–25 glucoside units,

(2) sorbitan monolaurate polyoxyethylenated with 20 moles of ethylene oxide,

(3) sorbitan monooleate polyoxyethylenated with 20 moles of ethylene oxide,

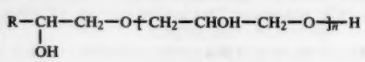
(4) polyoxyethylenated alkyl or alkenyl carboxylate of α-methyl glucoside wherein the alkyl or alkenyl moiety has 12–22 carbon atoms,

(5) polyoxyethylenated ester of a fatty acid and glycerol wherein the fatty acid contains 12–18 carbon atoms,

(6) the disodium salt of lauroyl-cycloimidinium1-ethoxyethanoic-1-ethanoic acid,

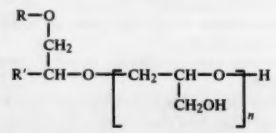
(7) a mixture of fatty alcohol sulfates,

(8) polyglycerolated ether of an α-diol having the formula



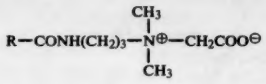
wherein R represents a mixture of C_{10} and C_{12}, and n is 3 or 4,

(9) polyglycerolated ether having the formula



wherein R is linear saturated C_8, R′ is linear saturated C_{16} and n is 10 or 12,

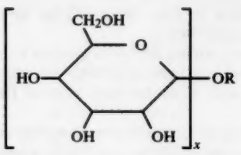
(10) amino-alkyl-betain of fatty acids having the formula



wherein R is $C_{11\text{-}17}H_{23\text{-}25}$,

(11) the imidazolinic derivative of copra condensed with sodium lauryl ether sulfate, and

(12) a glucoside ether having the formula



wherein x is 1–5 and R is 50/50 mixture of C_8 and C_{10}, and an effective amount of an extract of sarsaparilla (Smilax Species).

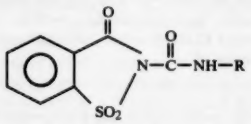
4,323,469

PROCESS FOR O-ACYLATING PHENOL DERIVATIVES AND ACYLATING COMPOSITIONS FOR THIS PURPOSE

György Lugosi, Felsögöd; Antal S. May, Budapest; Janos Bodnar, Budapest; Istvan Turcsan, Budapest; Istvan Jelinek, Budapest; Eva Somfai, Budapest, and Laszlo Simandi, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Filed Oct. 28, 1980, Ser. No. 201,508
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—182 **3 Claims**

1. An acylating composition for the acylation of phenolic hydroxyl groups, which comprises 5 to 50% by weight of a saccharin derivative of the formula (IV)



(IV)

wherein

R is alkyl having 1 to 8 carbon atoms, aryl, cycloalkyl having 5 or 6 carbon atoms, aralkyl having 7 to 16 carbon atoms, which can be substituted by one or more alkyl groups having 1 to 4 carbon atoms,

in admixture with 0.2 to 3% by weight but at least an equivalent amount of a base and 10 to 80% by weight of a solvent.

2. A composition as claimed in claim 1, which comprises as the saccharin derivative N-phenylcarbamoyl-benzoic acid sulfinide, N-methylcarbamoyl-benzoic acid sulfinide, N-butylcarbamoyl-benzoic acid sulfinide or N-(methylphenyl)-carbamoyl-benzoic acid sulfinide.

3. A composition as claimed in claim 1, which comprises triethyl amine as a base, and acetone as a solvent.

4,323,470
BATTERY PASTE FOR LEAD-ACID STORAGE BATTERIES

Basanta K. Mahato, Brown Deer, and Edwin C. Laird, Sussex, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Aug. 25, 1980, Ser. No. 180,883
Int. Cl.³ H01M *4/62, 4/56*
U.S. Cl. 252—182.1 **6 Claims**

4. A composition of materials adapted to be mixed with water and sulfuric acid to form an active material paste for the negative electrodes of a lead-acid cell comprising:

(a) 65 to 75 weight % lead oxide (PbO);

(b) 25 to 35 weight % free lead;

(c) 1 to 2 weight %, based on the total weight of (a) and (b), of one or more of the materials selected from the group comprising cellulose fiber, barium sulfate, lignosulfonate and channel black; and,

(d) 1.5 to 6.5 weight %, based on the total weight of (a) and (b), of milled glass fibers.

4,323,471
LIQUID CRYSTAL COMPOSITION

Nicholas L. Sethofer, San Jose, Calif., assignor to Timex Corporation, Waterbury, Conn.

Filed Dec. 11, 1980, Ser. No. 215,592
Int. Cl.³ G02F *1/13;* C09K *3/34*
U.S. Cl. 252—299.61 **4 Claims**

1. A nematic liquid crystal composition comprising:

4-heptylphenyl-4'-butylcyclohexane carboxylate	25–40 weight %
4-cyanophenyl-4'-propyl-cyclohexane carboxylate	10–20 weight %
4-cyanophenyl-4'-butylcyclohexane carboxylate	10–20 weight %
4-cyanophenyl-4'-pentylcyclohexane carboxylate	10–20 weight %
5-pentyl-2-cyanophenyl-1,3-dioxane	10–40 weight %
4-cyanophenyl-4''-propyl-4'-cyclohexyl-cyclohexanecarboxylate	3–15 weight %

4,323,472
LIQUID CRYSTAL ADMIXTURE

Nicholas L. Sethofer, San Jose, Calif., assignor to Timex Corporation, Waterbury, Conn.

Filed Dec. 11, 1980, Ser. No. 215,593
Int. Cl.³ G02F *1/13;* C09K *3/34*
U.S. Cl. 252—299.61 **5 Claims**

1. A nematic liquid crystal composition comprising:

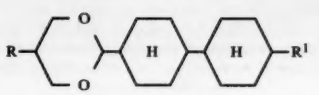
4-heptylphenyl-4'-butylcyclohexane carboxylate	20–40 weight %
4-cyanophenyl-4'-propylcyclohexane carboxylate	8–20 weight %
4-cyanophenyl-4'-butylcyclohexane carboxylate	8–20 weight %
4-cyanophenyl-4'-pentylcyclohexane carboxylate	8–20 weight %
5-butyl-2-cyanophenyl-1,3-dioxane	10–40 weight %
4-cyanophenyl-4''-pentyl-4'-cyclohexyl benzoate	2–10 weight %
4-cyanophenyl-4''-heptyl-'-cyclohexyl benzoate	2–10 weight %

4,323,473
CYCLOHEXYL CYCLOHEXYL DIOXANE LIQUID CRYSTALLINE COMPOUNDS AND ADMIXTURE CONTAINING SAME

Nicholas L. Sethofer, San Jose, Calif., assignor to Timex Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 219,672, Dec. 24, 1980, which is a continuation-in-part of Ser. No. 135,381, Mar. 28, 1980, Pat. No. 4,298,528. This application Jan. 19, 1981, Ser. No. 226,298
Int. Cl.³ G02F *1/13;* C09K *3/34;* C07D *319/04*
U.S. Cl. 252—299.61 **5 Claims**

1. A nematic liquid crystalline admixture including as an effective ingredient to broaden the nematic temperature range a compound of the formula:

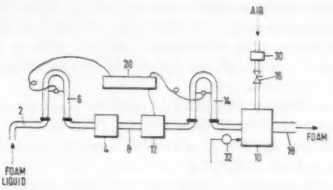


where R and R^1 independently can be the same or different straight chain alkyl or alkoxy group.

4,323,474
METHOD OF PRODUCING FOAM MATERIAL AND APPARATUS THEREFOR

Niels H. V. Hansen, Emmasvej; Erling H. Mikkelsen, Stokbrovej, and Soren Vissing, Blaboervej, all of Denmark, assignors to P. Campen Maskinfabrik A/S, Aarhus V., Denmark

Filed Oct. 17, 1979, Ser. No. 85,654
Claims priority, application United Kingdom, Oct. 16, 1975, 40663/78
Int. Cl.³ B01J *13/00;* B01F *3/04*
U.S. Cl. 252—307 **11 Claims**



1. A method of producing a foam material by continually supplying through a supply pump a pressurized flow of a material to be foamed into a mixer unit,

supplying an adjustable gas flow to said mixer unit,

causing the material to be foamed by the gas and exhausting the foam from the mixer in a continuous flow,

measuring the flow rate of the material to be foamed,

measuring the specific weight of the supply material flow at the input and output of said supply pump and

controlling one of the gas flow and the material supply flow in response to said measurements for maintaining the density of the produced foam material as constant as possible.

8. Apparatus for producing a foam material comprising

means for mixing a gas with a material to be foamed received from two respective inputs to produce a foamed material,

means for pumping said material to be foamed into said mixer,

means for sensing the specific weight of material at the input and output of said means for pumping to provide respective control inputs, and

means to control at least one of said inputs to said means for mixing in response to said control inputs.

4,323,475
PROCESS FOR THE PRODUCTION OF AMORPHOUS ALUMINOSILICATES AND THEIR USE AS CATALYSTS

William J. Ball, Capel; Keith W. Palmer, Weybridge, and David G. Stewart, Epsom, all of England, assignors to The British Petroleum Company Limited, London, England

Division of Ser. No. 80,477, Oct. 1, 1979, Pat. No. 4,299,732. This application Jun. 13, 1980, Ser. No. 159,183
Claims priority, application United Kingdom, Oct. 6, 1978, 39565/78
Int. Cl.³ C01B *3/22, 3/32*
U.S. Cl. 252—373 **10 Claims**

1. A process for the production of synthesis gas which comprises contacting methanol in the vapor phase at a temperature in the range of from 200° to 600° C. and a pressure up to 100

atmospheres with a catalyst consisting essentially of an amorphous alumino-silicate prepared by mixing under reaction conditions which effect formation of said alumino-silicate, a source of silica, a source of alumina, a source of alkali metal, water, and one or more polyamines other than a diamine.

4,323,476

ANTICORROSIVE AGENT FOR ALUMINIUM AND ALUMINIUM ALLOYS

Rainer Helwerth, Eschborn, and Horst Lorke, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 16, 1980, Ser. No. 169,362

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929413

Int. Cl.³ C23F *11/16, 11/14, 11/12*

U.S. Cl. 252—389 R **2 Claims**

1. Anticorrosive agent for aluminium and the alloys thereof consisting of

(A) 15 to 50% by weight of a product obtained by reaction of sulfochlorination products of aliphatic, alkylaromatic, or cycloaliphatic hydrocarbons having from 12 to 24 carbon atoms with ammonia or a C_1–C_3 alkyl or hydroxyalkyl amine with subsequent reaction with a C_2–C_{11}-halocarboxylic acid and conversion into an alkaline earth metal or the zinc salt,

(B) 40 to 90% by weight of a paraffinic hydrocarbon containing from 50 to 60% of C_{13}–C_{16} praffins, 50 to 40% of naphthenes and 0 to 1$ of aromatics and having a viscosity of from 3° to 5° E/20° C.,

(C) 1 to 4% by weight of the salt of a C_8–C_{19} alkyl amine and a C_8–C_{10} carboxylic acid,

(D) 1–4% by weight of an oxethylate of 1 mol of a C_8–C_{12} alkylphenol and 2 to 10 mols of ethylene oxide and

(E) 1 to 2% by weight of a C_4–C_8 aliphatic alcohol.

4,323,477

ACID COPPER CHROMATE CONCENTRATES

Robert E. Hill, Webster Groves, Mo., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1979, Ser. No. 81,396

Int. Cl.³ C09K *15/00*

U.S. Cl. 252—397 **13 Claims**

1. An aqueous copper chromate concentrate substantially free of sulfate anions formed of a hexavalent chromium compound selected from sodium dichromate, potassium dichromate, chromium trioxide and mixtures, a bivalent copper compound selected from basic cupric carbonate basic cupric hydroxide, cupric nitrate, cupric oxide and mixtures, and an acid selected from nitric, sulfamic, fluosilicic, fluoboric and mixtures wherein the total oxide content of CuO and CrO_3 is from 25 to 60% and the CuO to CrO_3 ratio is from 1 to 2.145 to 1 to 2.161.

4,323,478

NOVEL PARTICULATE COMPOSITIONS

Thomas H. Adams, Mission Viejo; James P. Beck, Garden Grove, and Robert C. Menson, Newport Beach, all of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

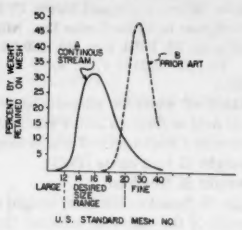
Division of Ser. No. 870,537, Jan. 18, 1977, Pat. No. 4,211,015. This application Dec. 19, 1979, Ser. No. 105,330

Int. Cl.³ G01N *33/16;* **F26B** *5/06*

U.S. Cl. 252—408 **10 Claims**

2. A composition comprising particles consisting essentially of a lyophilized solution of a blood plasma protein said particles having about 75 to 100% by weight in the U.S. Standard 12–20 mesh size range and about 0 to 25% by weight in a size range other than U.S. Standard 12–20 mesh.

6. A composition comprising particles of a lyophilized solution of clinically significant blood plasma constituents including a blood plasma protein, a first portion of said particles having a first homogeneous concentration of said constituents



and a second portion of said particles having a different homogeneous concentration of at least one of said constituents.

4,323,479

CATALYST FOR DECOMPOSITION OF 1,3-DIOXANES

Oleg E. Batalin, ulitsa Ordzhonikidze, 45, kv. 85; Arkady S. Dykman, ulitsa Leni Golikova, 37, korpus 4, kv. 15; Alexandr I. Osadchenko, ulitsa Sofiiskaya, 23, korpus 2, kv. 174; Galina F. Balkhanova, ulitsa Telmana, 48, korpus 3, kv. 60, all of Leningrad; Izrail M. Belgorodsky, Molodezhny bulvar, 50, kv. 25, Tolyatti; Vladimir I. Nevstruev, ulitsa Karla Marxa, 52, kv. 31, Tolyatti; Valery A. Radionov, ulitsa Matrosova, 30, kv. 180, Tolyatti; Eduard A. Tulchinsky, ulitsa Ushakova, 46, kv. 12, Tolyatti; Valentin M. Belyaev, prospekt Lenina, 32, kv. 20, Volzhsky; Jury I. Smolin, prospekt Lenina, 97, kv. 494, Volzhsky; Mark I. Breiman, ulitsa Chaikovskogo, 17, kv. 12, Volzhsky; Vitaly V. Orlyansky, ulitsa Pionerskaya, 8''a'', kv. 4, Volzhsky; Nikolai Y. Zhirnov, ulitsa Sovetskaya, 59, kv. 35, Volzhsky; Nikolai V. Galibin, ulitsa Pushkina, 122, kv. 49, Volzhsky; Andrian P. Troitsky, ulitsa Miklukho-Maklaya, 65, korpus 2, kv. 46, Moscow, and Vladimir V. Kovalenko, ulitsa Tsiolkovskogo, 7/2, kv. 38, Voronezh, all of U.S.S.R.

Filed Jul. 25, 1980, Ser. No. 172,635

Int. Cl.³ B01J *21/02*

U.S. Cl. 252—432 **7 Claims**

1. A catalyst for the decomposition of 1,3-dioxanes, consisting essentially of calcium oxide, phosphorus pentoxide, chlorine, water and boron oxide, in the following ratio expressed in mass percent:

calcium oxide: 48.5 to 53.5

phosphorus pentoxide: 42.5 to 46.5

chlorine: 0.05 to 1.0

boron oxide: 0.005 to 3.0

the balance being water.

4,323,480

METHOD OF PREPARING DI AND POLY CHALCOGENIDES OF GROUP IVB, VB, MOLYBDENUM AND TUNGSTEN TRANSITION METALS BY LOW TEMPERATURE PRECIPITATION FROM NON-AQUEOUS SOLUTION AND THE PRODUCT OBTAINED BY SAID METHOD

Martin B. Dines, Westfield, N.J., and Russell R. Chianelli, Brooklyn, N.Y., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 59,548, Jul. 23, 1979, abandoned, which is a continuation of Ser. No. 641,424, Dec. 17, 1975, abandoned. This application May 19, 1980, Ser. No. 151,450

Int. Cl.³ B01J *27/02;* **H01B** *1/06;* **C01B** *17/00, 19/00*

U.S. Cl. 252—439 **24 Claims**

1. A method for the preparation of chalcogenides of the formula MX_y wherein M is a metal selected from the group consisting of IVb, Vb, molybdenum and tungsten transition metals of the Periodic Table of the Elements, X is selected from the group consisting of sulfur, selenium and tellurium,

and y is a number ranging from about 2 to about 4, which comprises reacting in the absence of aqueous protic solution a solution of a transition metal salt, the transition metal being selected from the group consisting of Group IVb, Vb, molybdenum, and tungsten with a source of sulfide, selenide or telluride ions which source is selected from the group consisting of Li_2X, Na_2X, K_2X, LiHX, NaHX, KHX, $(NH_4)_2X$, $(NH_4)HX$, $(RNH_3)_2X$, $(RR'NH_2)_2X$, $(RR'R''NH)_2X$, wherein R, R' and R'' are the same or different and are selected from the group consisting of C_1 to C_{20} alkyl and C_6 to C_{20} aryl groups and X is the chalcogen selected from the group consisting of sulfur selenium and tellurium at a temperature of from −78° C. to 400° C. for a time sufficient for reaction to occur.

4,323,481

SYNTHESIS OF MOLECULAR SIEVES USING BETA-DIKETONES AS ORGANIC TEMPLATES

James A. Kaduk, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 26, 1981, Ser. No. 238,592
Int. Cl.³ C01B *33/28;* B01J *29/06*
U.S. Cl. 252—455 Z **21 Claims**

1. A method to prepare a crystalline aluminosilicate comprising (1) forming an aqueous mixture of an oxide of aluminum, an oxide of silicon, a metal cation and a beta-diketone, (2) maintaining the pH of such mixture between about 9 and about 14 and (3) crystallizing such mixture.

4,323,482

CATALYST AND METHOD OF PREPARATION

Alvin B. Stiles, Wilmington, Del., and Glenn L. Schrader, Jr., Ames, Iowa, assignors to University of Delaware, Newark, Del.

Continuation-in-part of Ser. No. 66,433, Aug. 14, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,591
Int. Cl.³ B01J *21/04, 23/10, 23/78, 23/86*
U.S. Cl. 252—462 **8 Claims**

1. A catalyst composition comprising an intimate mixture of at least two metal oxides one of which is reducible to either a sub-oxide or substantially to the elemental metal state whereas the other is a refractory oxide which is substantially non-reducible, which mixture has been exposed to a reducing gas in sufficient quantity and at a temperature in the range of 550° C. to 1000° C. to cause a substantial inhibition or disruption of crystallite growth as evidenced by x-ray diffraction pattern analysis, concomitantly enhancing catalytic activity.

4,323,483

MIXED OXIDE BONDED COPPER CONDUCTOR COMPOSITIONS

Joseph R. Rellick, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 8, 1979, Ser. No. 92,711
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—512 **6 Claims**

1. A thick film conductor composition for application to a dielectric ceramic substrate consisting essentially of a mixture of 65 to 90 percent by weight copper, copper oxide, and one or more of lead oxide and bismuth oxide powders and 10 to 35 percent by weight of a vehicle and solvent mixture.

4,323,484

GLAZE RESISTOR COMPOSITION

Masumi Hattori; Toru Ishida, both of Hirakata, and Shinichi Tanaka, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 23, 1979, Ser. No. 97,044
Claims priority, application Japan, Nov. 25, 1978, 53-145482
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—521 **6 Claims**

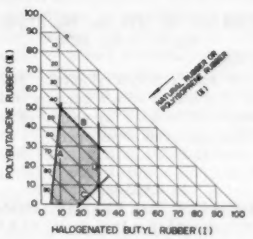
1. A glaze resistor composition which consists essentially of 95 to 50% by weight of a glass frit and 5 to 50% by weight of a mixture of silicides comprising molybdenum disilicide, tantalum disilicide, magnesium silicide and aluminium, the molar ratio of molybdenum disilicide plus tantalum disilicide plus magnesium silicide to aluminium being from 90:10 to 60:40.

4,323,485

RUBBER COMPOSITIONS FOR TIRE TREADS HAVING LOW ROLLING RESISTANCE

Asahiro Ahagon; Makoto Misawa; Kazuo Miyasaka, all of Hiratsuka, and Hiroshi Hirakawa, Isehara, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 134,238
Claims priority, application Japan, Apr. 9, 1979, 54-42011
Int. Cl.³ C08L *7/00, 9/00, 15/02, 47/00*
U.S. Cl. 525—237 **3 Claims**



1. A rubber composition for tire treads having improved rolling resistance and wet road braking performance, consisting essentially of, by weight, (I) 7–30 parts of at least one member selected from the group consisting of a chlorinated butyl rubber having a 1.0–2.0 wt. % chlorine content and a brominated butyl rubber having a 1.0–2.0 wt. % bromine content, (II) 40–73 parts of at least one member selected from the group consisting of natural rubber and a polyisoprene rubber containing at least 90% of cis-1,4-bonding units and (III) at least 20 but not more than 50 parts of a polybutadiene rubber with the proviso that the total amount of the rubbers (I), (II) and (III) is 100 parts.

4,323,486

ALBUMIN-FIXED RESIN, PRODUCTION THEREOF, AND THERAPEUTICAL USE THEREOF

Hideaki Suzuki, and Gentaro Yamashita, both of Koganei, Japan, assignors to Teijin Limited, Osako, Japan

Filed Nov. 12, 1980, Ser. No. 205,997
Claims priority, application Japan, Nov. 12, 1979, 54-145503
Int. Cl.³ C07G *7/00;* C08H *1/00;* C08L *89/00;* C09J *3/24*
U.S. Cl. 525—54.1 **17 Claims**

1. An albumin-fixed resin comprising a crosslinked water-insoluble resin and albumin chemically bound thereto, said water-insoluble resin being a crosslinked epoxy resin containing about 1 to about 30 milliequivalents of at least one of primary, secondary, and tertiary amino groups and about 1 to about 50 milliequivalents of hydroxyl groups per gram thereof, said albumin being ionically bound to the amino groups of the epoxy resin and to the hydroxyl groups by hydrogen bonding, and the amount of said albumin fixed being at least about 25% by weight based on the epoxy resin.

7. A process for producing the albumin-fixed resin of claim 1, which comprises

(1) (a) subjecting a polyepoxy compound containing at least two epoxy groups in the molecule and a polyamine compound containing at least two primary and/or secondary amino groups in the molecule to addition reaction in an inert medium to produce a fully crosslinked resin, or (b) subjecting said compounds to addition reaction to produce an insufficiently crosslinked pre-polymer, and then reacting the

pre-polymer with at least one compound selected from the group consisting of organic polyisocyanates, organic polyisothiocyanates and organic polycarboxylic acid halides to crosslink it fully, and

(2) contacting the resulting crosslinked epoxy resin containing about 1 to about 30 milliequivalents of amino groups and about 1 to about 50 milliequivalents of hydroxyl groups per gram thereof intimately with an aqueous solution containing albumin optionally after partially neutralizing the amino groups of the epoxy resin.

4,323,487

ABSORBENT STARCH GRAFT POLYMER AND METHOD OF ITS PREPARATION

Duane A. Jones, Minneapolis, and Lyle F. Elmquist, St. Paul, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Oct. 22, 1979, Ser. No. 87,682
Int. Cl.³ C08L *3/04*
U.S. Cl. 525—54.32 **15 Claims**

1. Hydrolyzed starch polyacrylonitrile graft copolymer which has been crosslinked with a quantity of formaldehyde comprising about 0.1% to 6.0% by weight of the hydrolyzed starch polyacrylonitrile graft copolymer.

4,323,488

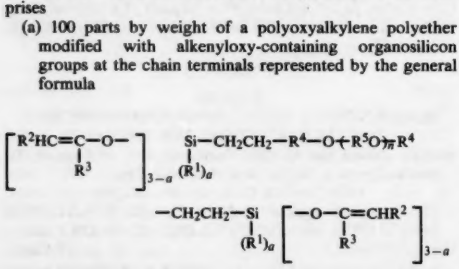
METHOD FOR THE PREPARATION OF SILICONE-MODIFIED POLYOXYALKYLENE POLYETHERS AND ROOM TEMPERATURE-CURABLE COMPOSITIONS THEREWITH

Toshio Takago; Masatoshi Arai, and Koji Futatsumori, all of Annaka, Japan, assignors to Shin-Etsu Chemical Company Limited, Tokyo, Japan

Filed Mar. 14, 1980, Ser. No. 130,565
Claims priority, application Japan, Mar. 26, 1979, 54-35254; Mar. 30, 1979, 54-38014
Int. Cl.³ C08L *91/00*
U.S. Cl. 528—32 **7 Claims**

1. A room temperature-curable composition which comprises

(a) 100 parts by weight of a polyoxyalkylene polyether modified with alkenyloxy-containing organosilicon groups at the chain terminals represented by the general formula



where R^1 is a substituted or unsubstituted monovalent hydrocarbon group or a triorganosiloxy group, R^2 is a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group, R^3 is a substituted or unsubstituted monovalent hydrocarbon group, R^4 is a divalent hydrocarbon group, R^5 is a divalent hydrocarbon group having from 1 to 4 carbon atoms, a is a number of zero, 1 or 2 and n is a positive integer, and having an average molecular weight in the range from 400 to 15,000, and

(b) from 0.01 to 10 parts by weight of a curing agent.

5. The composition of claim 1 wherein the curing agent is a curing accelerator, curing catalyst, or crosslinking agent.

6. The composition of claim 5 wherein the curing accelerator is a metal salt of a carboxylic acid, organic ester of titanic acid, aminoalkyl substituted alkoxysilane, amine, amine salt, quaternary ammonium salt, guanidine compounds, guanidyl-containing organosilane or guanidyl-containing organopolysiloxane.

4,323,489

EXTREME LOW MODULUS RTV COMPOSITIONS

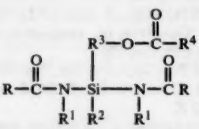
Melvin D. Beers, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,959
Int. Cl.³ C08L *91/00*
U.S. Cl. 524—788 **43 Claims**

1. A room temperature vulcanizable silicone rubber composition with very low modulus comprising

(A) 100 parts by weight of silanol endstopped diorganopolysiloxane having a viscosity varying from 100 to 100,000 centipoise at 25° C. when the organo is a monovalent hydrocarbon radical;

(B) from 1 to 5 parts by weight of a coupler having the formula



where R, R^1, R^2, R^4 are monovalent hydrocarbon radicals of 1 to 8 carbon atoms, R^3 is a divalent hydrocarbon radical of 2 to 8 carbon atoms; and

(C) from 0.01 to 5.0 parts by weight of cross-linking agent selected from the class consisting of ketoxime functional silanes and aminoxy functional silane compounds and mixtures thereof.

5. The composition of claim 1 wherein there is further present from 0.001 to 2 parts by weight of a tin salt of a carboxylic acid.

4,323,490

MIXTURES OF COMPONENTS, COMPRISING EPOXIDE/POLYALKYLENE-POLYAMINOAMIDE REACTION PRODUCTS AND ACRYLIC-BASED AND/OR STYRENE-BASED POLYMERS, THEIR PREPARATION AND THEIR USE AS PAPER SIZES AND TEXTILE TREATMENT AGENTS

Rosemarie Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,338
Claims priority, application Switzerland, Mar. 28, 1980, 2490/80
Int. Cl.³ C08L *63/10*
U.S. Cl. 523—409 **42 Claims**

1. A mixture of components which contains, as component (A), at least one water-dispersible or water-soluble salt of a reaction product, this salt being prepared by reacting (a) 1.0 epoxy group equivalent of a diglycidyl ether of 2,2-bis-(4'-hydroxyphenyl)-propane, (b) 0.2 to 5.0 amino group equivalents of a polyalkylenepolyaminoamide of (b') a polymerised, unsaturated fatty acid which is derived from fatty acids having 12 to 24 carbon atoms and (b'') an aliphatic polyalkylenepolyamine having 4 to 12 carbon atoms, (c) 0 to 0.6 amino group equivalent of at least one primary fatty amine having 12 to 24 carbon atoms, 1.0 to 5.0 amino group equivalents of component (b) being employed if component (c) is absent, and 0.5 to 2.0 amino group equivalents of component (b) being employed if component (c) is used, and (d) 0 to 0.1 mol of an epihalogenohydrin, in the presence of an inert, organic solvent at temperatures up to 110° C., it being ensured, by adding an acid, at the latest when the reactions have ended, that a sample of the reaction mixture diluted with water to 10 to 40 percent by weight has a pH value of 2 to 8, a salt being formed, and, as component (B), a homopolymer of styrene or a copolymer of styrene or acrylonitrile and an alkyl acrylate or methacrylate having 4 to 12 carbon atoms in the alkyl radical.

4,323,491

POLYURETHANE ADHESIVE COMPOSITION

Roman A. Veselovsky, Kharkovskoe shosse, 21/3, kv. 179; Anatoly N. Kuxin, ulitsa Geroev Oborony, 9/10, kv. 27, both of Kiev; Oleg A. Mudrov, ulitsa Dvinskaya, 15, kv. 164, Leningrad, and Yakov I. Roitenberg, ulitsa Gagarina, 2/35, kv. 30, Kiev, all of U.S.S.R.

Filed Apr. 24, 1980, Ser. No. 143,464
Int. Cl.[3] C08L *75/06*
U.S. Cl. 524—144 7 Claims

1. In an adhesive composition comprising a prepolymer of polydiethylene glycol adipate and tolylene diisocyanate, polyisocyanate and trichlorethylphosphate, the improvement which comprises the inclusion of an additive mixture comprising: water, urea and sodium sulphoricinate.

4,323,492

PLASTICIZER CONTAINING POLYVINYL ALCOHOL GRANULES

Wolfgang Zimmermann, and Albrecht Harreus, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 22,869, Mar. 21, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,627
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812684; Sep. 22, 1978, 2841238
Int. Cl.[3] C08K *3/18, 5/05;* C08L *29/04*
U.S. Cl. 524—388 20 Claims

1. A process for the manufacture of plasticizer-containing, pourable, tack-free granular polyvinyl alcohol capable of thermoplastic processing comprising the steps of

intensely and homogeneously mixing 100 parts by weight of dry polyvinyl alcohol granules, at least 70% of which consist of particles having a diameter of from 0.4 to 4 mm, and 5 to 50 parts by weight of a plasticizer, in the presence of an amount of water insufficient to dissolve the polyvinyl alcohol granules, and

during the mixing step, raising and then lowering the temperature of the mixture for a period of time and in such a manner that the polyvinyl alcohol granules swell and temporarily agglomerate and then are broken up to form plasticizer-containing polyvinyl alcohol particles of which at least 70% by weight are from 0.8 to 4 mm in diameter.

4,323,493

INJECTION MOLDABLE AMIDE-IMIDE POLYMERS CONTANING DIVALENT ALIPHATIC RADICALS DERIVED FROM ALIPHATIC DIAMINES

Robert G. Keske, and James R. Stephens, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

PCT No. PCT/US81/00074, § 371 Date Jan. 7, 1981, § 102(e) Date Jan. 7, 1981
Continuation-in-part of Ser. No. 112,650, Jan. 16, 1980, abandoned. This PCT application Jan. 7, 1981, Ser. No. 245,641
Int. Cl.[3] C08G *69/26*
U.S. Cl. 524—451 12 Claims

1. A process for the preparation of ordered linear injection moldable polyamide-imide polymers which process comprises reacting fully acylated aliphatic, cycloaliphatic or araliphatic diamines with tricarboxylic acid anhydrides compounds and aliphatic, cycloaliphatic or araliphatic diamines in a molar ratio of about 1.1:2:0.9 to 0.9:2:1.1 at a temperature of about 100 to 700 Fahrenheit.

4,323,494

PROCESS FOR THE PRODUCTION OF CELLULOSE-SILICATE PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 221,432, Dec. 30, 1980, which is a continuation-in-part of Ser. No. 169,973, Jul. 18, 1980, which is a continuation-in-part of Ser. No. 884,135, Mar. 7, 1978, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,072,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Jun. 29, 1981, Ser. No. 278,089
Int. Cl.[3] C08L *83/02*
U.S. Cl. 524—858 20 Claims

1. The process for the production of polyurethane lignin-cellulose silicate prepolymer by the following steps:

(a) mixing and reacting 1 to 100 parts by weight of an oxidized silicate compound, selected from the group consisting of oxidized alkali metal silicate, oxidized alkaline earth metal silicate, oxidized mono alkali metal silicic acid, oxidized silicic acid and mixtures thereof, 50 parts by weight of plant cellulose particles, selected from the group consisting of cotton, wood cellulose, regenerated cellulose, sulfate cellulose produced by the Kraft process, sulfite cellulose, mechanical pulp cellulose, vegetable cellulose, cellulose esters and semichemical cellulose, a salt-forming compound selected from the group consisting of hydrochloric and sulfuric acid and in an amount wherein the mixture of the components has a pH of 1.5 to 5 after the reaction is complete, thereby producing lignin-cellulose silicate product containing impregnated hydrated silica;

(b) mixing 50 parts by weight of an organic polyisocyanate or polyisothiocyanate with 1 to 100 parts by weight of the dried lignin-cellulose silicate product containing impregnated hydrated silica and allowing to react,

(c) thereby producing a polyurethane lignin-cellulose silicate prepolymer.

4,323,495

NOVEL BRANCHED-CHAIN MONOALCOHOLS AND DERIVATIVES THEREOF, LUBRICANT COMPOSITIONS FOR POLYMERS AND WAX COMPOSITIONS IN WHICH THESE NOVEL PRODUCTS ARE INCORPORATED

Jacobus J. Zeilstra, Wijnbergen; Willem J. de Klein, Dieren, and Joannes D. Bik, Eerbeek, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 26, 1979, Ser. No. 88,614
Claims priority, application Netherlands, Oct. 26, 1978, 7810669
Int. Cl.[3] C08L *91/00*
U.S. Cl. 524—156 15 Claims

1. Novel branched-chain monoalcohols having at least 20 carbon atoms and the derivatives thereof selected from the group consisting of

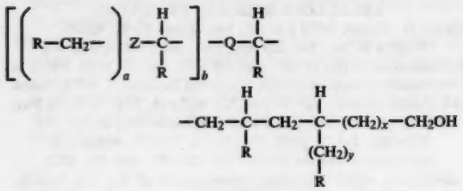
(a) esters of aromatic, aliphatic or cycloaliphatic acids having at least 2 carbon atoms and 1,2 or 3 carboxyl groups;

(b) urethanes of aromatic, aliphatic or cycloaliphatic isocyanates;

(c) monoethers of polyalkylene oxide glycols having 2 to 50 alkylene oxide units each containing 2 or 3 carbon atoms and the alkylpolyoxyalkylene sulfates derived therefrom;

(d) sulfates,

characterized in that the structure of said branch-chain monoalcohol conforms to the formula:



where
x is 0 or 2
and y is 0 or 2,
where
when y=2, x=0 and when y=0, x=2,
R=$CH_3(CH_2)_n$, where n represents an integer from 3 to 42;
b is 0 or 1, where
when b=0, Q represents a hydrogen atom, and when b=1, Q represents a CH_2-group, and
a=0 or 1, where
when a=0, z represents a hydrogen atom, and
when a=1, z represents a CH_2-group.

10. A resin composition having improved internal and external lubricant properties, comprising a polymer or copolymer of vinyl chloride and 0.1 to 5% by weight, calculated on the polymer, of said branched-chain monoalcohol and/or said derivative thereof according to the preamble of claim **1**, characterized in that at least 40 percent by weight of said branched-chain monoalcohol present as such, or at least 40 percent of said derivatives thereof have a branched-chain structure, and that at least 10 percent by weight thereof correspond to the formula given in claim **1**.

4,323,496

INNOXIOUS INTERFERON-INDUCING SUBSTANCE, INDUCING AGENT AND PROCESS FOR PRODUCING SAME

Ikusaburo Mitani, 46-19, Narashinodai 5-chome, Funabashi-shi, Chiba-ken, Japan

Filed Mar. 26, 1980, Ser. No. 134,060
Claims priority, application Japan, Jul. 14, 1979, 54/89463
Int. Cl.³ C07G *7/00*
U.S. Cl. 260—112 R **7 Claims**

1. Method of producing an interferon-inducing substance, which comprises comminuting a protein source containing essential amino acids and also containing proteins of hetero-arrangement and being selected from the group consisting of glycoproteins, nucleoproteins, chromoproteins and phosphoroproteins, distributing the thus obtained particulate protein source in oil, uniformly heating the oil mixture at a temperature of 203°–298° C. to denature the protein source into material including the essential amino acids and material including the proteins of hetero-arrangement, and separating said material including the essential amino acids, said material constituting an interferon-inducing substance.

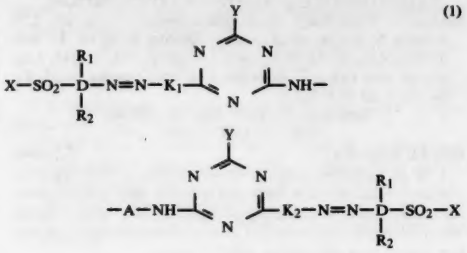
4,323,497

WATER-SOLUBLE DISAZO DYESTUFFS

Ernst Hoyer; Fritz Meininger, both of Frankfurt am Main, and Rudolf Fass, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

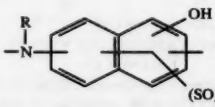
Filed Oct. 31, 1978, Ser. No. 956,322
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1977, 2748975
Int. Cl.³ C09B *45/00, 29/22*
U.S. Cl. 260—146 T **16 Claims**

1. A water soluble dyestuff which in the form of the free acid has the formula (1)

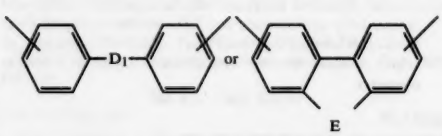


(1)

in which K_1 and K_2 are identical or different to each other and have in the form of the free acid, the formula



in which R is hydrogen or alkyl and p is 1 or 2, K_1 and K_2 being bonded via the amino groups to the s-triazine radicals and bonded by the azo groups in ortho-position to their hydroxy groups, D is a benzene nucleus or naphthalene nucleus, R_1 is in ortho-position to the azo group and is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, carboxy or sulfo and R_2 is hydrogen, halogen, lower alkyl, lower alkoxy, nitro or sulfo, R_1 and R_2 being identical or different from one another; X is β-thiosulfatoethyl, β-chloroethyl, β-sulfatoethyl or vinyl, A is an aliphatic radical of 2–10 C atoms or an aliphatic radical of, in total, 2–6 C atoms, which may be interrupted by a hetero-atom and/or a cycloaliphatic radical, or is a cycloaliphatic radical or is a benzene nucleus or a naphthalene nucleus, these nuclei being unsubstituted or substituted by substituents selected from the group consisting of lower alkyl, lower alkoxy, chlorine, sulfo, carboxy and lower alkanoylamino, or is



in each of which the benzene nuclei may be substituted by substituents selected from the group consisting of lower alkyl, lower alkoxy, sulfo, carboxy and chlorine, and D_1 is a direct covalent bond or a bridge member and E is —O—, —S—, —NH— or —SO_2—, Y is chlorine, fluorine, bromine, sulfo or a group of the formula —S—R′— or —O—R″, in which R′ is a substituent selected from the group consisting of lower alkyl, substituted lower alkyl, phenyl, naphthyl, substituted phenyl, substituted naphthyl or 2-benzthiazolyl and R″ is hydrogen or has the meaning of R′ with the exception of 2-benzthiazolyl, or Y is an amino group of the formula —NR_3R_4, in which R_3 is hydrogen, an optionally substituted lower aliphatic radical, an optionally substituted araliphatic radical or a cycloaliphatic radical and R_4 is hydrogen, an optionally substituted lower aliphatic radical or an optionally substituted aromatic radical or an optionally substituted araliphatic radical or is hydroxy or lower alkoxy or an optionally substituted amino group, or R_3 and R_4 together with the nitrogen atom form a ring containing lower alkylene and optionally a hetero-atom, and a copper, chromium or cobalt complex dyestuff of the compounds of formula (1) wherein one or both of the R_1s are hydroxy.

4,323,498

CARBOCYCLIC DISAZO COMPOUNDS CONTAINING A 2-AMINO-8-HYDROXY-5- OR 6-SULFO-NAPHTHALENE-2 COUPLING COMPONENT RADICAL

Francois Benguerel, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

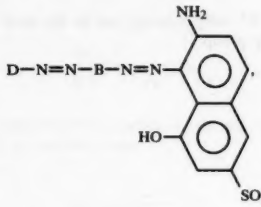
Continuation-in-part of Ser. No. 818,008, Jul. 22, 1977, abandoned. This application Jan. 9, 1979, Ser. No. 2,226

Claims priority, application Switzerland, Jul. 28, 1976, 9638/76; Dec. 15, 1978, 12787/78

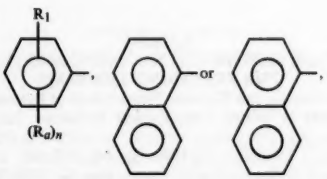
Int. Cl.[3] C09B *31/04, 29/04*

U.S. Cl. 260—187 41 Claims

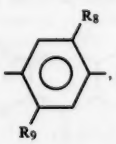
1. A compound of the formula



or a mixture of such compounds,
wherein D is



wherein R_1 is —$COOR_2$ or m— or p—NR_5COR_6,
wherein
R_2 is C_{1-12}alkyl,
R_5 is hydrogen or C_{1-4}alkyl, and
R_6 is C_{1-6}alkyl, C_{1-6}alkoxy or C_{1-6}alkyl monosubstituted by chloro or methoxy,
each
R_a is halo, C_{1-4}alkyl or C_{1-4}alkoxy and
n is 0, 1 or 2,
B is 1,4-naphthylene, 5,8-(1,2,3,4-tetrahydronaphthylene) or



wherein
each of R_8 and R_9 is independently hydrogen, C_{1-4}alkyl or C_{1-4}alkoxy, and
M is hydrogen or a non-chromophoric cation.

4,323,499

6-(2-ARYL-2-(1,1-DIOXOPENICILLANOYLOXY-METHOXYCARBONYL)ACETAMIDO PENICILLANIC ACIDS

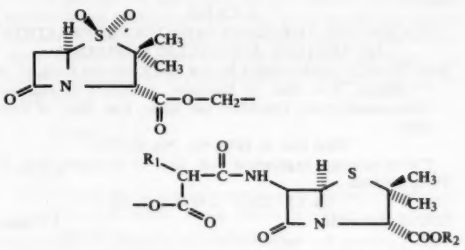
Robert F. Myers, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,239

Int. Cl.[3] C07D *499/32, 499/58*

U.S. Cl. 260—239.1 12 Claims

1. A compound of the formula



wherein R_1 is phenyl or 3-thienyl;
and R_2 is hydrogen or benzyl;
and, when R_2 is hydrogen, a salt thereof with a pharmaceutically acceptable base.

4,323,500

METHOD FOR PREPARING 7α-ACYLTHIO-4-EN-3-OXOSTEROIDS

Hiromi Okushima, Kawasaki; Shinichiro Fujimori, Yokohama; Rikizo Furuya, Yokohama, and Shuzo Hayakawa, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,949

Claims priority, application Japan, Mar. 13, 1980, 55-31789

Int. Cl.[3] C07J *17/00*

U.S. Cl. 260—239.57 12 Claims

1. A method for preparing 7α-acylthio-4-en-3-oxosteroids, comprising, contacting a steroidal material which contains a 7β-acylthio-4-en-3-oxosteroid with a thiocarboxylic acid.

2. The method according to claim 1 wherein the 7β-acylthio-4-en-3-oxosteroid is 7β-acetylthio-17-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone.

4,323,501

ESTERS OF PHOSPHOROUS ACID

Erich Eimers, Krefeld; Dieter Margotte, Krefeld-Bookum; Helmut Schmid, Krefeld, and Rolf Dhein, Krefeld-Bookum, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

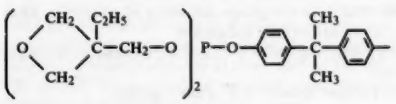
Division of Ser. No. 635,010, Nov. 25, 1975, Pat. No. 4,073,769, which is a continuation of Ser. No. 409,503, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 278,909, Aug. 9, 1972, Pat. No. 3,794,629. This application Oct. 18, 1977, Ser. No. 843,186

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1971, 2140207; Nov. 14, 1972, 2255639

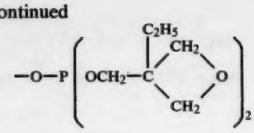
Int. Cl.[3] C07F *9/145*

U.S. Cl. 260—333 14 Claims

1. The phosphite:



-continued



4,323,502

PROCESS FOR THE SIMULTANEOUS PREPARATION OF TRIOXAN AND CYCLIC FORMALS

Karl-Friedrich Mück; Günter Sextro, and Karlheinz Burg, all of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 4, 1979, Ser. No. 81,933
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843468
Int. Cl.³ C07D *323/06, 317/10*
U.S. Cl. 260—340 4 Claims

1. A process for the simultaneous synthesis of trioxan and dioxolan, which comprises reacting a mixture consisting of 50% to 70% concentrated aqueous formaldehyde and of from 1 to 25 weight percent, referred to formaldehyde, of ethylene glycol or ethylene oxide with an acid catalyst, at a temperature of from 30° to 150° C.

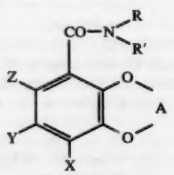
4,323,503

SUBSTITUTED 2,3-ALKYLENE DI (OXY) BENZAMIDES AND DERIVATIVES

Michel Thominet; Gerard Bulteau, both of Paris; Jacques Acher, Itteville, and Claude Collignon, Saint Remy les Chevreuse, all of France, assignors to Societe d'Etudes Scientifiques et Industrielles de L'ile-de-France, Paris, France

Division of Ser. No. 821,123, Aug. 2, 1977, Pat. No. 4,186,135. This application Jun. 12, 1979, Ser. No. 47,968
Claims priority, application France, Aug. 4, 1976, 76 23835
Int. Cl.³ C07D *319/18;* A61K *31/335*
U.S. Cl. 260—340.3 5 Claims

1. Substituted 2,3-alkylene bis(oxy) benzamides, their pharmaceutically acceptable acid addition salts, their quaternary ammonium salts, their oxides, and their dextrorotatory and levorotatory isomers, having the formula:



wherein:

A is a C_{2-3} alkylene group;

X is selected from the group consisting of hydrogen, halogen, C_{1-4} alkoxy, nitro, amino, and acetamino;

Y is selected from the group consisting of hydrogen, halogen, nitro, amino, acetamino, C_{1-4} alkylsulfonyl, sulfamoyl, C_{1-4} alkylsulfamoyl, C_{1-4} dialkylsulfamoyl, cycloalkylsulfamoyl, and adamantylsulfamoyl;

Z is selected from the group consisting of hydrogen, halogen, nitro, amino, and acetamino;

R′ is a hydrogen atom or a C_{1-4} alkyl, adamantyl or benzyl group;

R is a hydrogen atom or a C_{1-4} alkyl group.

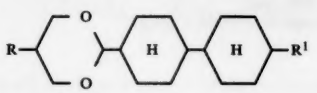
4,323,504

CYCLOHEXYL CYCLOHEXYL DIOXANE LIQUID CRYSTALLINE COMPOUNDS AND ADMIXTURE CONTAINING SAME

Nicholas L. Sethofer, San Jose, Calif., assignor to Timex Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 135,381, Mar. 28, 1980, Pat. No. 4,298,528. This application Dec. 24, 1980, Ser. No. 219,672
Int. Cl.³ G02F *1/13;* C09K *3/34;* C07D *319/04*
U.S. Cl. 260—340.7 5 Claims

1. A liquid crystalline compound of the formula:



where R and R^1 independently can be the same or different alkyl or alkoxy group.

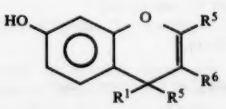
4,323,505

POLYALKYLHYDROXYCHROMENE AND PROCESS FOR PREPARING THE SAME

Isao Hashimoto, and Hirohiko Nambu, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 27, 1980, Ser. No. 163,660
Claims priority, application Japan, Jun. 27, 1979, 54-80133
Int. Cl.³ C07D *311/70, 311/04*
U.S. Cl. 260—345.2 4 Claims

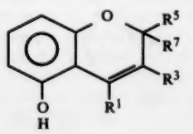
1. A compound represented by the formula (III)



(III)

wherein R^1 and R^5 each represents an alkyl group having 1 to 3 carbon atoms, and R^6 represents a hydrogen atom or an alkyl group having a carbon atom number smaller than that of R^1 by one.

2. A compound represented by the formula (VI)



(VI)

wherein R^1 and R^5 and R^7 each represents an alkyl group having 1 to 3 carbon atoms, and R^3 represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms.

4,323,506

PREPARATION OF GAMMA-PYRONES

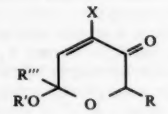
Thomas M. Brennan, Old Lyme; Daniel P. Brannegan, Pawcatuck; Paul D. Weeks, Gales Ferry, and Donald E. Kuhla, Gales Ferry, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 971,897, Dec. 21, 1978, abandoned, which is a division of Ser. No. 869,493, Jan. 16, 1978, Pat. No. 4,147,705, which is a division of Ser. No. 721,885, Sep. 9, 1976, Pat. No. 4,082,717, which is a continuation-in-part of Ser. No. 710,901, Aug. 2, 1976, abandoned. This application Sep. 4, 1979, Ser. No. 72,057

Int. Cl.[3] C07D *309/22*

U.S. Cl. 260—345.8 R 3 Claims

1. A compound of the formula



wherein R is alkyl of 2 to 4 carbon atoms, phenyl or benzyl; R_1' is alkyl of 1 to 4 carbon atoms or

wherein R'' is methyl, ethyl or phenyl; R''' is hydrogen or alkyl of 1 to 4 carbon atoms; and X is chlorine or bromine.

4,323,507

VALPROATE CONJUGATION USING DICARBONYLS

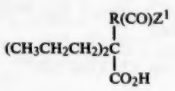
Danton K. Leung, San Jose, and Prithipal Singh, Santa Clara, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 11,254, Feb. 12, 1979, Pat. No. 4,238,389. This application Jul. 14, 1980, Ser. No. 168,867

Int. Cl.[3] C07D *309/10;* C07C *59/74, 55/02*

U.S. Cl. 260—345.9 R 9 Claims

1. Compound of the formula:

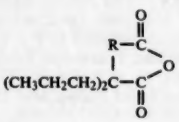


wherein:

R is an alkylene group of from 2 to 4 carbon atoms; and

Z^1 is -hydroxy, alkoxy of from 1 to 6 carbon atoms, or an oxy group forming an activated ester which readily reacts with the amine groups of poly(amino acids) under mild conditions in an aqueous medium.

6. Compound of the formula:



wherein: R is an alkylene group of from 2 to 4 carbon atoms.

4,323,508

PROCESS FOR THE MANUFACTURE OF FURAN COMPOUNDS

Daniel R. Herrington, Chesterland, and Albert P. Schwerko, Solon, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 866,313, Jan. 3, 1978, abandoned. This application Feb. 2, 1979, Ser. No. 8,716

Int. Cl.[3] C07D *307/36*

U.S. Cl. 260—346.11 31 Claims

1. A process for converting acyclic conjugated diolefinic hydrocarbons containing from 4 to 10 carbon atoms to furan and alkyl-substituted furans comprising reacting said conjugated diolefins with molecular oxygen in the liquid phase in an inert organic solvent in the presence of a catalyst having the composition:

$$[R_xM\ (L)_y]_z$$

wherein

R is an organic ligand selected from the group consisting of alkyl, aryl, alkene, diene, triene, or alkyne radicals containing from 1 to 8 carbon atoms;

L is a ligand selected from the group consisting of carbon monoxide and a halogen;

M is a transition metal or mixtures thereof, selected from Groups IVB, VB, VIB, VIIB and VIII of the Periodic classification of elements;

and wherein

x is 0 to 2,

y is 0 to 6, and

x+y is 1 to 6,

and wherein z is 1 to 6.

4,323,509

PROCESS FOR THE PREPARATION OF ALKYL FURANS

David J. Milner, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 11, 1981, Ser. No. 262,775

Claims priority, application United Kingdom, Jun. 11, 1980, 19152/80

Int. Cl.[3] C07D *307/28*

U.S. Cl. 260—346.11 7 Claims

1. A process for the preparation of alkylfurans which comprises reacting furan with an alkyl halide in the presence of iron (III) oxide and an iron (II) halide or iron (III) halide as catalyst.

4,323,510

BROWN VAT DYE AND ITS PREPARATION

Helmut Hoch, and Heinrich Hiller, both of Wachenheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,189

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926025

Int. Cl.[3] C07C *50/18;* C09B *1/00*

U.S. Cl. 260—367 10 Claims

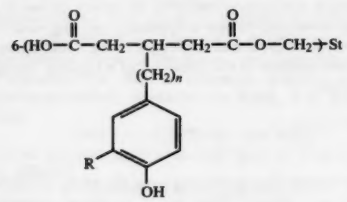
1. A vat dye obtained by heating a condensation product itself obtained by heating 3,9-di-(1-anthraquinonylamino)-benz[d,e]anthrone in a melt of aluminum chloride and picoline or quinoline or a mixture of these in the presence of sulfuryl chloride or thionyl chloride at from 110° to 140° C. - at from 100° to 180° C. in a melt of an alkali metal hydroxide in an alcohol or a glycol or an aqueous glycol.

4,323,511
STEROID DERIVATIVES AND THEIR USE IN RADIOIMMUNOASSAYS

Ravi K. Varma, Belle Mead, and Sam T. Chao, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 22, 1978, Ser. No. 908,294
Int. Cl.[3] C07J 7/00
U.S. Cl. 260—397.45 12 Claims

1. A steroid having the formula



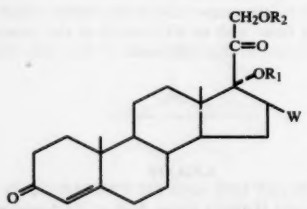
wherein St is a 6-dehydro derivative of a 3-oxo-4,5-dehydro steroid intended for radioimmunoassay, said steriod being saturated in the 1,2-position; R is hydrogen or alkyl of 1 to 3 carbon atoms; and n is 0, 1, 2, 3 or 4.

4,323,512
PROCESS FOR THE PREPARATION OF STEROIDAL 17α-ARYLCARBOXYLATES

Ronald C. D. Breslow, Englewood, N.J., and Craig S. Wilcox, New York, N.Y., assignors to Schering Corporation, Kenilworth, N.J.

Filed May 13, 1981, Ser. No. 263,323
Int. Cl.[3] C07J 1/00
U.S. Cl. 260—397.47 5 Claims

1. A process for preparing a steroid ester selected from the group consisting of 4-pregnenes of formula I



wherein

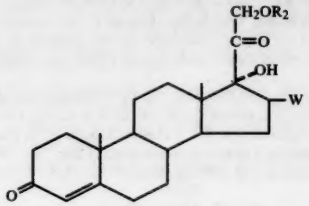
R_1 is an acyl radical of a hydrocarboncarboxylic acid containing an aryl group having up to 12 aromatic carbon atoms and which may be substituted by halogeno, methyl, or methoxy;

R_2 is an acyl radical of a lower alkanoic acid or benzoic acid and methyl-substituted derivatives thereof;

W is hydrogen or β-methyl; and

the 1-dehydro, 6-dehydro and 1,6-bis-dehydro analogs thereof;

which comprises the reaction of a 17α-hydroxy steroid selected from the group consisting of a 4-pregnene of formula II



wherein

W and R_2 are as defined hereinabove;

and the 1-dehydro, 6-dehydro, and 1,6-bis-dehydro analogs thereof;

with lower alkyl lithium, a reagent selected from the group consisting of $(R_1)_2O$, and R_1X, wherein R_1 is as hereinabove defined and X is chlorine, bromine or iodine, and a 4-(di-lower alkyl)aminopyridine in a non-reactive solvent at temperatures in the range of from about −40° C. to about −80° C.

4,323,513
PRODUCTION OF METHYL ESTERS AND ETHYLENE GLYCOL ESTERS FROM REACTION OF CARBON MONOXIDE AND HYDROGEN IN PRESENCE OF RUTHENIUM CATALYST

Bernard D. Dombek, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 971,750, Dec. 21, 1978, abandoned.
This application Nov. 4, 1980, Ser. No. 204,025
Int. Cl.[3] C07C 67/36, 69/003
U.S. Cl. 260—410.6 1 Claim

1. The process for producing methyl and ethylene glycol esters which comprises reacting carbon monoxide and hydrogen in a homogeneous liquid phase mixture comprising a ruthenium carbonyl complex and an acyl compound selected from the group consisting of a carboxylic acid, a carboxylic acid anhydride and mixtures thereof, at a temperature of between about 50° C. and about 400° C. and a pressure of between about 500 psia. and about 12,500 psia. wherein the combined concentration of methyl ester, ethylene glycol ester and water in the reaction medium is maintained at less than about 30 volume percent.

4,323,514
COFFEE OIL

Albrecht Dieffenbacher, Saint-Legier, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jul. 7, 1980, Ser. No. 166,146
Int. Cl.[3] C09F 5/02
U.S. Cl. 260—412.3 7 Claims

1. A process for improving coffee oil consisting essentially of contacting coffee oil, under conditions of agitation, with a solution of a strong mineral acid in a monohydric aliphatic alcohol containing from 1 to 3 carbon atoms and then separating the oil layer from the alcohol layer.

4,323,515
PROCESS FOR THE PREPARATION OF ORGANIC ISOCYANATES FROM NITRO DERIVATIVES

Jean-Marie Cognion, Saint Genis Laval, and Jacques Kervennal, Lyons, both of France, assignors to P C U K Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Sep. 20, 1979, Ser. No. 77,521
Claims priority, application France, May 15, 1979, 79 12272
Int. Cl.[3] C07C 119/048
U.S. Cl. 260—453 P 39 Claims

1. A process for the synthesis of aromatic isocyanates which

comprises reacting an aromatic mononitro derivative with carbon monoxide in the presence of a catalyst consisting of a metal complex of a porphyrin.

4,323,516

METHOD FOR MAKING THIOBISCARBAMATES

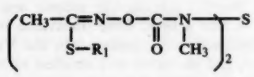
Robert W. Ashworth, Hackettstown, N.J., and Wallace Y. Fu, South Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 70,535, Sep. 5, 1979, Pat. No. 4,256,655. This application Oct. 21, 1980, Ser. No. 199,382

Int. Cl.³ C07C *119/18*

U.S. Cl. 260—453.3 2 Claims

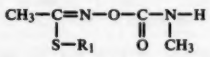
1. A method for making a compound of the formula



wherein R_1 is methyl, ethyl, n-propyl, isopropyl, n-butyl or isobutyl comprising the steps of:

(a) Reacting pyridine with a sulfur chloride selected from the groups of SCl_2, S_2Cl_2, and mixtures thereof to form pyridine-sulfur chloride adduct, in the presence of excess pyridine, and

(b) reacting said adduct with carbamate of the formula



wherein R is as previously defined, in the presence of pyridine.

4,323,517

METHOXY AND METHYLSULFINYLTHIOLESTERS

Wolfgang Opitz; Eugen Etscherberg, both of Cologne; Hans-Dieter Dell, Berg. Gladbach, and Haireddin Jacobi, Leichlingen, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Division of Ser. No. 963,651, Nov. 24, 1978, Pat. No. 4,246,278. This application Aug. 29, 1980, Ser. No. 182,353

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753786; Jun. 3, 1978, 2824386

Int. Cl.³ C07C *153/017*

U.S. Cl. 260—455 R 3 Claims

1. A compound selected from the group consisting of S-methyl 3-methylsulphinylpropionothioate and S-methyl 3-methoxypropionothioate.

4,323,518

POLYNITROETHYLTHIONOCARBONATES AND METHOD OF PREPARATION

William H. Gilligan, Fort Washington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1981, Ser. No. 235,305

Int. Cl.³ C07C *154/00*

U.S. Cl. 260—455 B 5 Claims

1. Bis(2,2-dinitropropyl)thionocarbonate.

4,323,519

METHOD OF WASHING ORGANIC SOLVENT SOLUTION OF POLYCARBONATE

Hazime Mori; Katsuhisa Kohyama; Katsuhiko Nakamura, and Shinichi Takamatsu, all of Kita-Kyushu, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Apr. 11, 1979, Ser. No. 29,044

Claims priority, application Japan, Apr. 19, 1978, 53/46093

Int. Cl.³ C07C *68/02*

U.S. Cl. 528—499 7 Claims

1. In a method for washing a methylene chloride solution of a polycarbonate obtained by the phosgene method, containing impurities arising from said phosgene method which are soluble in an aqueous washing liquid, the improvement comprising (1) mixing said methylene chloride solution of said polycarbonate from said phosgene method in concentration of 8 to 20 wt.% with a sufficient amount of said aqueous washing liquid to form a water in oil dispersed phase, (2) adding to said mixture from Step (1) a sufficient amount of said aqueous washing liquid to produce a phase inversion from said water in oil dispersed phase into an oil in water dispersed phase, and (3) carrying out a phase separation whereby said methylene chloride solution of the purified polycarbonate is separated from said aqueous washing liquid containing said impurities.

4,323,520

PREPARATION OF METHACRYLIC DERIVATIVES FROM TERTIARY-BUTYL-CONTAINING COMPOUNDS

Harley F. Hardman, Lyndhurst; James L. Callahan, Wooster, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Division of Ser. No. 711,014, Aug. 2, 1976, Pat. No. 4,065,507. This application May 9, 1977, Ser. No. 794,875

Int. Cl.³ C07C *120/00, 120/14*

U.S. Cl. 260—465.9 1 Claim

1. A process for producing methacrylonitrile by the ammoxidation of an alkyl-tertiary butyl ether wherein the alkyl group contains from 1 to 4 carbon atoms, in the presence of steam, at an elevated temperature, and in the presence of a catalyst having the formula:

$$A_a C_c Fe_e Bi_f D_d Mo_g O_x$$

wherein

A is an alkali metal, barium, strontium, thallium, indium, silver, copper or mixtures thereof;

C is nickel, cobalt, magnesium, zinc, manganese, cadmium, calcium or mixtures thereof;

D is phosphorus, antimony, germanium, chromium, thorium, tin, niobium, praseodymium, tungsten, boron, zirconium, cerium, arsenic, or mixtures thereof; and

wherein

a is a number from 0 to 3;

c is a number from 0.001 to 12;

d is a number from 0 to 3;

e and f are each a number from 0.01 to 12;

g is 12; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,323,521

CONSTANT DEPRESSION CARBURETOR

Henri Morgenroth, 3090 Hidden Valley La., Santa Barbara, Calif. 93108

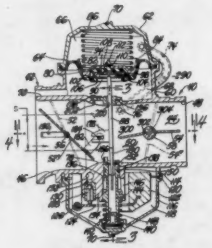
Filed Dec. 18, 1980, Ser. No. 217,666

Int. Cl.³ F02M *7/22*

U.S. Cl. 261—50 A 56 Claims

1. A constant depression carburetor for a combustion engine, comprising carburetor body means, induction passage means formed by said body means, said induction passage means comprising an upstream air inlet end and a downstream fuel-air mixture outlet end, a fuel-air mixing region in said induction

passage means generally between said inlet end and said outlet end, first and second rotatable throttle means in said induction passage means, said first throttle means being situated generally upstream of said fuel-air mixing region, said second throttle means being situated generally downstream of said mixing region, said second throttle means being effective for controlling the rate of discharge of said fuel-air mixture through said outlet end, fuel metering orifice means effective for discharging fuel into said fuel-air mixing region, metering rod means, said metering rod means comprising an axially extending contoured fuel metering portion, said metering rod means being situated generally transversely of said induction passage means as to pass generally through said mixing region and as to have said contoured fuel metering portion received by said fuel metering orifice means, pressure responsive motor means, said pressure responsive motor means comprising pressure responsive wall means, vacuum passage means, said vacuum passage means being effective for communicating the fuel-metering vacuum generated in said mixing region to one side of said pressure responsive wall means, said axially extending fuel



metering portion being effective to cooperate with said fuel metering orifice means to thereby define varying effective metering orifice areas, and coupling means for operatively interconnecting said first throttle means, said pressure responsive movable wall means and said axially extending fuel metering portion, said coupling means comprising first connecting means operatively interconnecting said movable wall means and said axially extending fuel metering portion, said first connecting means permitting angular movement of said axially extending metering portion relative to said movable wall means, said coupling means further comprising second connecting means operatively interconnecting said first throttle means to said axially extending fuel metering portion, said second connecting means being effective to cause angular rotation of said first throttle means whenever said axially extending fuel metering portion moves axially while simultaneously permitting said axially extending fuel metering portion to have freedom of movement in directions generally transverse to the axial movement of said axially extending fuel metering portion.

4,323,522

INTERNALLY VENTED FLOAT BOWL PRIMER ARRANGEMENT

Jerome L. Rasmussen, Timberline, Conn., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Sep. 24, 1980, Ser. No. 190,332
Int. Cl.³ F02M 1/16
U.S. Cl. 261—72 R **3 Claims**

1. A single control fixed fuel metering carburetor for providing a combustible fuel-air mixture to a conventionally aspirated internal combustion engine comprising:

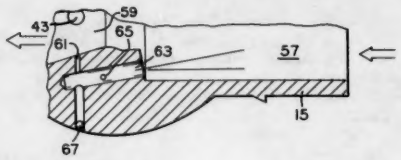
a carburetor bore forming part of the engine air intake path and having a restricted Venturi region therein;

a float regulated fuel supply chamber;

a fuel well gravity fed from the float regulated chamber;

conduit means for conveying fuel from the fuel well to air passing through the carburetor bore in the region of the Venturi; and

a bifurcated fuel supply chamber air vent conduit having one branch communicating with the bore in the region of the Venturi and another branch communicating with the bore outside the region of the Venturi formed in a body portion of the carburetor as three generally cylindrical holes, the



first and largest of which is a blind hole opening into the bore outside the Venturi region, the second and next largest of which is also a blind hole transverse to and intersecting the first hole and opening into the Venturi region of the bore, and the third and smallest of which extends from an upper surface of the fuel supply chamber to intersect the first hole.

4,323,523

PROCESS AND APPARATUS FOR PRODUCING SPHERICAL PARTICLES AND FIBERS WITH A SPECIALLY FIXED SIZE FROM MELTS

Setsuo Ueda, Chigasaki; Takashi Yasuda, Aichi; Tokuyoshi Yamada, Nagoya, and Shigeki Kobayashi, Tokai, all of Japan, assignors to Sato Technical Research Laboratory Ltd., Kanagawa and Itoh Metal Abrasive Co., Ltd., Aichi, both of, Japan

Filed Aug. 27, 1979, Ser. No. 69,851
Claims priority, application Japan, Aug. 29, 1978, 53-104430
Int. Cl.³ B01J 2/02
U.S. Cl. 264—8 **6 Claims**

1. A process for producing spherical particles with an analytically predetermined diameter from a melt comprising:

establishing a kinematic viscosity of the melt in a range of 0.001 to 10 cm^2/sec.; wherein said melt consists essentially of at least one material selected from the group consisting of metal, slag, flux and a mixture thereof;

introducing the melt through a conduit at a predetermined outflow velocity in a range of 5 to 500 cm/sec onto a rotating disk having a flat refractory surface with a diameter between 50 and 200 mm and a rotational speed in the range of 3,000 to 30,000 rpm;

said conduit having an outlet with a radius r_o of 3 to 30 mm so that the distance h_o between said conduit outlet and said disk surface is maintained within a range of $(r_o/2)$ to $(r_o/2+2$ mm);

said melt forming a thin film stream having a predetermined thickness, at least, in the proximity of the periphery of said disk surface by centrifugal force, said thin film stream having a tangential velocity component as well as a radial velocity component throughout the entire thickness thereof, said thickness being established by said diameter of said disk, said rpm of said disk, and said kinematic viscosity of the melt;

projecting said thin film stream into a free space of air atmosphere from the periphery of said disk by said centrifugal force resulting from the rotation of said disk;

wherein said thin film stream is split into free linear streams with a predetermined radius by a termination of said tangential velocity component and the additional action of surface tension;

splitting said free linear streams further into spherical droplets having a predetermined diameter by decelerating the velocity of said streams to a fixed value through air resistance and surface tension acting on the streams; and

solidifying said droplets whereby spherical particles with an analytically predetermined diameter are produced.

4,323,524

PRODUCTION OF FIBRES

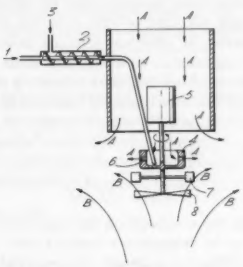
Paul Snowden, Redcar, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 92,857, Nov. 9, 1979, abandoned, which is a continuation of Ser. No. 885,344, Mar. 10, 1978, Pat. No. 4,178,336. This application May 9, 1980, Ser. No. 148,521

Claims priority, application United Kingdom, Mar. 11, 1977, 10405/77; May 15, 1979, 16863/79; Feb. 21, 1980, 05838/80

Int. Cl.[3] B22D *23/08*

U.S. Cl. 264—8 10 Claims



1. A process for the manufacture of fibres from a thermosetting formaldehyde resin comprising feeding the resin together with a resin-curing catalyst, which at temperatures above 100° C. will cure and chemically stabilise the resin and render it insoluble in cold water, in liquid form into a spinning cup rotating about a substantially vertical axis, feeding cold, humid, air into the cup, the temperature and humidity of the air being such that it inhibits drying and reaction of the resin/catalyst mixture whilst the cup, the rotation of the cup causing the resin/catalyst mixture to flow as an even film over the inner surface of the cup and to be spun centrifugally from the outer wall of the cup in the form of individual separate fibres entrained in an outwardly directed stream of said cold, humid, air within which said fibres attenuate until they have achieved the desired diameter, contacting the fibres with a stream of hot, dry, air at a temperature such as to dry the attenuated fibres and to transport them to a collecting zone, and collecting the dry fibres from the collecting zone.

4,323,525

ELECTROSTATIC SPINNING OF TUBULAR PRODUCTS

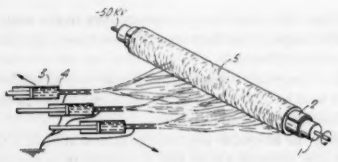
Alan Bornat, Liverpool, England, assignor to Imperial Chemical Industries Limited, London and University of Liverpool, Liverpool, both of, England

Filed Apr. 19, 1979, Ser. No. 31,606

Claims priority, application United Kingdom, Apr. 19, 1978, 15419/78

Int. Cl.[3] B29D *23/00*; A61F *1/00*; A61B *17/00*; B29C *13/00*

U.S. Cl. 264—24 13 Claims



1. A method of preparing a tubular product by electrostatically spinning a fibre-forming material and collecting the resulting spun fibres upon a former, the former comprising a core and a removable sheath thereon.

4,323,526

METHOD FOR SEALING PIPE JOINTS

Edward O. Hilbush, III, West Chester, Pa., assignor to Rubco Products, Inc., West Chester, Pa.

Filed Jun. 2, 1980, Ser. No. 155,494

Int. Cl.[3] B29H *5/06*

U.S. Cl. 264—36 5 Claims

1. A method for sealing a pipe joint comprising:

installing an electrical resistance heating element around the pipe the joint, said heating element being detachably connected to a source of electricity;

installing and securing a flexible mold around the pipe joint to enclose the heating element within the mold cavity;

heating the pipe joint and the interior of the mold cavity to a predetermined temperature range by causing a current to flow through said heating element;

injecting a chemically settable, flexible sealing material into the mold cavity, said sealing material having an accelerated curing rate within said predetermined temperature range;

curing the sealing material by maintaining the temperature of the interior of the mold cavity within the predetermined temperature range at least until the sealing material has initially cured; and

detaching said element from said source.

4,323,527

METHOD FOR MAKING LIGHT WEIGHT CONCRETE BUILDING ELEMENTS

Helmut Katzenberger, Archenweg 52, A-6020 Innsbruck, Austria

Continuation-in-part of Ser. No. 989, Jan. 4, 1979, abandoned. This application Oct. 10, 1980, Ser. No. 196,094

Claims priority, application Austria, Aug. 1, 1978, 5567/78

Int. Cl.[3] B29D *27/00*

U.S. Cl. 264—45.1 4 Claims

1. A method of making light weight concrete building elements comprising the steps of:

foaming expandable polymer beads using saturated steam for a period of about 2 minutes to 10 minutes, preferably 1.5 minutes to 2.5 minutes, exposing the foamed beads to air under atmospheric conditions for a period between 0.5 minutes and 15 minutes, preferably between 2 and 8 minutes,

then mixing the beads with a cementitious mixture including a binding agent, inorganic aggregates and water for a period of 0.5 minutes to 10 minutes, preferably 1.5 minutes to 2.5 minutes, and

placing the mixture thus formed within 45 minutes, preferably within 15 minutes, into a mold and applying pressure thereto momentarily; and then releasing the mixture from the mold to form a light weight concrete building element whereby the foamed beads are irreversibly compressed in the mold so as to not expand once the pressure applied to the mold is released to destroy the light weight concrete building element before the binding agent has set.

4,323,528

METHOD AND APPARATUS FOR MAKING LARGE SIZE, LOW DENSITY, ELONGATED THERMOPLASTIC CELLULAR BODIES

Frederick H. Collins, Glens Falls, N.Y., assignor to Valcour Imprinted Papers, Inc., Glens Falls, N.Y.

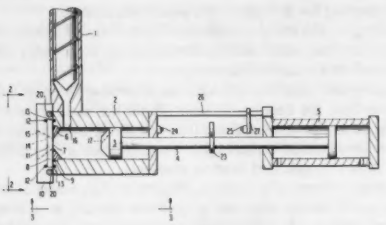
Filed Aug. 7, 1980, Ser. No. 176,041

Int. Cl.[3] B29D *27/00*; B29F *3/014*

U.S. Cl. 264—53 18 Claims

1. In a method for the production of an elongated, thermo-

plastic cellular body from a foamable mobile gel, that improvement providing low density, elongated cellular bodies of large lateral cross-sectional area comprising: forming a mixture of a thermoplastic polymer and, dissolved therein under pressure, a blowing agent, said mixture having a temperature at which the viscosity of said mixture is sufficient to retain said blowing agent when said mixture is allowed to expand; extruding said mixture into a holding zone maintained at a temperature and pressure which does not allow the resulting mixture to foam, said holding zone having an outlet die defining an orifice open-



ing into a zone of lower pressure at which said mixture foams, and an openable gate closing said die orifice; periodically opening said gate and substantially concurrently applying mechanical pressure by a movable ram on said mixture to eject said mixture from said holding zone through said die orifice into said zone of lower pressure, at a rate greater than that at which substantial foaming in said die orifice occurs and less than that at which substantial irregularities in cross-sectional area or shape occurs; and permitting said ejected mixture to expand unrestrained in at least one dimension to produce an elongated thermoplastic cellular body.

4,323,529

METHOD FOR MAKING A REFRACTORY ARTICLE

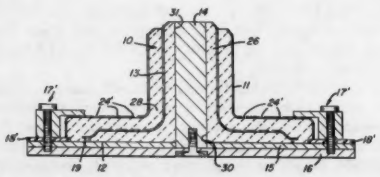
Michael A. Roberts, and Martin Copperthwaite, both of Sheffield, England, assignors to USS Engineers and Consultants, Inc., Pittsburgh, Pa.

Filed Nov. 13, 1980, Ser. No. 206,582

Claims priority, application United Kingdom, Dec. 14, 1979, 43236/79

Int. Cl.³ B29D 3/00; B28B 1/08

U.S. Cl. 264—69 9 Claims



1. A method of making a refractory article having a surface portion which, in service, is contacted by a molten metal stream, including the steps of (i) forming a first mould space from a trough or cup shaped metal foil and a companion, permanent mould member the shape of which is a negative of said surface portion, (ii) filling said first mould space with a mouldable refractory concrete and at least partially curing the concrete; (iii) assembling the foil and moulding therein in a second mould space formed from companion mould members; (iv) filling the second mould space with a second refractory concrete, which is of lower duty than the first concrete; and (v) curing the second concrete and, to the extent that it may not already be completely cured, the first concrete also.

4,323,530

METHOD OF LUBRICATING COMPRESSION TOOLS OF MOLDING MACHINES

Günther Voss, Brietbrunn, and Peter Gruber, Biberach an der Riss, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 897,571, Apr. 19, 1978, abandoned. This application Feb. 7, 1980, Ser. No. 119,479

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717438; Mar. 23, 1978, 2812677

Int. Cl.³ B29D 7/02

U.S. Cl. 264—109 14 Claims

1. A method for the compression molding of tablets, pill cores, cores for hard gelatin capsules, and the like, which comprises:

before each molding operation spraying unto each molding surface of compression molding tools for molding tablets, pill cores, cores for hard gelatin capsules, or the like a measured amount of lubricant selected from the group consisting of suspensions, solutions, and melts of lubricating agents selected from the group consisting of fatty acids and their salts, metal soaps, fatty acid esters, higher aliphatic alcohols, polyethylene glycols, paraffin, and silicon oil by means of intermittently and briefly spraying nozzle system, the amount of lubricant deposited comprising from about 0.5 to 5% of the material to be compression molded;

introducing into the compression molding tools lubricant-free material to be compression molded; and

compression molding the lubricant-free material.

4,323,531

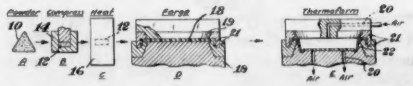
PROCESS FOR FORMING A PLASTIC ARTICLE

Norbert L. Bradley; Kenneth J. Cleereman, and Ritchie A. Wessling, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 484,498, Jul. 1, 1974, abandoned, which is a division of Ser. No. 215,632, Jan. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 119,669, Mar. 1, 1971, abandoned. This application Oct. 28, 1976, Ser. No. 736,628

Int. Cl.³ D04H 1/16

U.S. Cl. 264—113 14 Claims



1. A process for forming a plastic article from thermoplastic polymeric resinous powder wherein a sufficient quantity of said powder for making said article is compressed into a briquette having green strength, the improvement comprising the steps of:

(a) heating said briquette to a temperature in the range from about the alpha transition temperature to less than the melt temperature thereof;

(b) maintaining said temperature for a period sufficient to soften said briquette and sinter the same short of substantial fusion thereof; and

(c) forging the briquette into said article while the briquette is at a temperature within said temperature range to effect substantial plug flow deformation of the briquette and obtain substantial fusion of the powder forming said briquette.

4,323,532
METHOD FOR COMPRESSING AND AGGLOMERATING COAL DUST

Hugo Bleckmann, Bonn, and Kellerwessel, Aachen, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,698

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947386

Int. Cl.³ B01J *2/22*

U.S. Cl. 264—118 **4 Claims**

1. A method for forming granulates from finely divided coal particles which comprises:

feeding said particles at a temperature below the coal softening point into a roll press operating at a compressive force of at least 20 kN per cm of roll width and a circumferential velocity of up to 1.0 m/sec to form a solid sheet without the addition of extraneous binders, and

grinding the resulting sheet into granulates.

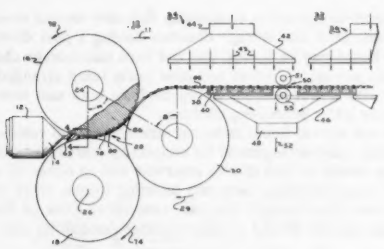
4,323,533
ROTARY FORMING OF ARTICLES

George H. Bramhall, Boulder, Colo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 67,463, Aug. 17, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,141

Int. Cl.³ B28B *11/16*

U.S. Cl. 264—145 **21 Claims**



1. In the method of continuously forming substantially flat articles having varying cross sectional profiles by steps which include:

(a) continuously introducing molten thermoplastic material from a die opening into a nip formed by opposing rotating rolls, at least one roll having a cooled arcuate mold cavity in its surface contoured to substantially correspond to the profile of the articles thereby providing varying clearances in the nip;

(b) progressively successively arcuately forcing the cooled cavity into shaping engagement with the molten thermoplastic material to mold the articles therefrom;

(c) maintaining the thermoplastic material containing the articles in contact with one of the rolls after exiting the nip thereby forming a first, curved intermediate shape with portions having said varying cross sectional profiles therein, the temperature within the thickness of said portions being greater than that of said portions adjacent to the cooled cavity surface;

(d) extracting said portions from the curved molds by sliding said portions along the mold walls while flexing the cooled outer surfaces inwardly as a result of the increased temperature within the thickness, as said at least one roll continues to rotate;

(e) passing such shape over a cooled cylindrical surface to further yet not completely set the thermoplastic material while transposing said first shape into a second intermediate shape reversely configured from the first shape;

(f) discharging the second, incompletely-set shape in a substantially planar direction to straighten the second shape and transpose the articles into a substantially flat condition; and thereafter

(g) separating the articles from the remainder of the thermoplastic material;

the improvements minimizing stress levels in the articles which comprise:

conductively increasing the temperature of the outer surfaces of said varying cross sectional portions during steps (d), (e) and (f) as a result of the greater temperature within the thickness to anneal the outer surfaces of said varying cross sectional portions thereby substantially relieving stresses developed in the outer surface during mold removal; and then

gradually uniformly further cooling the intermediate shape to fully set the thermoplastic material without generating substantial additional stresses therein.

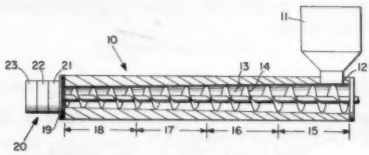
4,323,534
EXTRUSION PROCESS FOR THERMOPLASTIC RESIN COMPOSITION FOR FABRIC FIBERS WITH EXCEPTIONAL STRENGTH AND GOOD ELASTICITY

Thomas A. DesMarais, Norwood, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 17, 1979, Ser. No. 104,260

Int. Cl.³ B28B *3/20*

U.S. Cl. 264—176 R **10 Claims**



1. A process for making fibers comprising the steps of:

(a) mixing a composition comprising:

(i) from about 20% to about 50% by weight of a fatty chemical selected from the group consisting of fatty acids containing from about 12 to about 24 carbon atoms and fatty alcohols containing from about 12 to about 24 carbon atoms; and

(ii) from about 80% to about 50% by weight of an A-B-A block copolymer wherein A is selected from the group consisting of polystyrene and poly(alpha-methylstyrene) and B is poly(ethylene-butylene);

(b) heating said composition to a temperature of from about 195° C. to about 240° C.; and

(c) extruding said composition into fibers.

4,323,535
MANUFACTURE OF THERMOPLASTICS PIPE

William C. Aston, Halesowen, and Derek Walker, East Ardsley, both of England, assignors to Imi Yorkshire Imperial Plastics Limited, Leeds, England

Filed Sep. 10, 1980, Ser. No. 185,924

Claims priority, application United Kingdom, Sep. 15, 1979, 32062/79

Int. Cl.³ B29C *17/07*

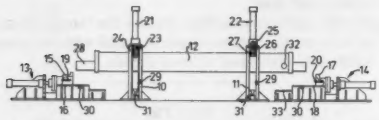
U.S. Cl. 264—528 **10 Claims**

1. A method of manufacturing a length of thermoplastics pipe of circular cross-section by the radial expansion of a thermoplastics tubular pipe blank within a circular cross-section mould, said blank having an external diameter which is less than the interior diameter of the mould, said method including the steps of;

(a) inserting the blank into a substantially horizontally-extending cylindrical central mould portion, said central mould portion being in a raised position relative to a

mould end portion, such that the blank after insertion rests on the lowermost internal surface of the central mould portion and extends outwardly of the end of the central mould portion adjacent the mould end portion,

(b) lowering the central mould portion containing the blank to a first predetermined position adjacent to but not registering with the mould end portion, said mould end portion having a mandrel which in said first predetermined position is capable of entering an end of the blank, and advancing the mould end portion towards the central mould portion, the extent of said advance being predetermined



such that the mandrel enters an open end of the blank, but the mould end portion is not closed to the central mould portion,

(c) lowering the central mould portion containing the blank to a second predetermined position co-axial with the mould end portion, and

(d) advancing the mould end portion towards the central mould portion to close the mould in preparation for the heating and expansion of the pipe blank, and radially expanding the blank into contact with the internal surface of the mould.

4,323,536

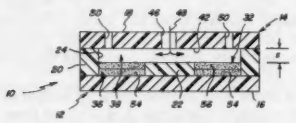
MULTI-ANALYTE TEST DEVICE

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1980, Ser. No. 118,840

Int. Cl.³ G01N *21/78, 33/68, 33/62*

U.S. Cl. 422—56 **6 Claims**



1. A multi-analyte test device for the analysis of a plurality of analytes in a liquid, the device comprising,

a first member,

a second covering member, said members having opposing surfaces,

means for spacing said members apart a distance effective to induce capillary flow of liquid introduced between said surfaces and to create a liquid transport zone,

at a first location, access means permitting introduction of a quantity of liquid into said zone, said access means being in either said first or second members or said spacing means, said first or second member opposite to said access means being configured to create a temporary energy barrier to liquid flow beyond the vicinity of said access means;

a plurality of individual test elements disposed on one of said members at locations other than said first location and spaced away from the other of said members, said other member in the areas directly opposite to said test elements being recessed, at least two of said elements each respectively comprising a test composition for the generation of a detectable response indicative of a different one of the analytes, and

control means for confining liquid flow from said access means to a plurality of predetermined flow paths each of which extends to only one of said test elements,

whereby all of said analytes from a single quantity of the liquid are each detectable by the respective test element for that analyte without contamination from others of said test elements.

4,323,537

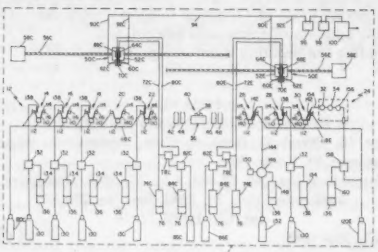
ANALYSIS SYSTEM

Dinesh I. Mody, Bedford, Mass., assignor to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Oct. 20, 1980, Ser. No. 198,632

Int. Cl.³ G01N *1/14, 35/00*

U.S. Cl. 422—63 **21 Claims**



1. Analysis apparatus comprising first and second storage chambers, each said storage chamber having a port through which liquid may be flowed into and from said storage chamber, said storage chambers and their ports being arranged to permit concurrent flowing of liquids from both said storage chambers into a processing chamber,

first and second liquid metering means, a diluent reservoir, and a valve arrangement for connecting one of said metering means to said diluent reservoir and to either of said storage chambers, each said metering means, when connected to a storage chamber, controlling flow of liquid into and out of said storage chamber through its port.

4,323,538

HYDROGENATION APPARATUS

Jerry E. Sinor, Longmont, Colo., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 871,163, Jan. 20, 1978, Pat. No. 4,243,509, which is a continuation of Ser. No. 689,002, May 24, 1976, abandoned. This application Jul. 28, 1980, Ser. No. 172,744

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ B01J *8/08;* C10G *1/06;* F27B *15/08;* H05B *3/40*

U.S. Cl. 422—207 **5 Claims**

1. A hydrogenation apparatus having a single reaction chamber for reacting hydrogen and a pulverized carbonaceous material at a desired hydrogenation reaction temperature to form desired gaseous and liquid hydrocarbon reaction products, said apparatus comprising:

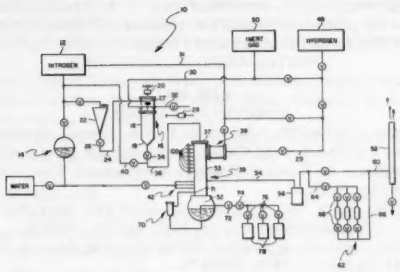
a source of hydrogen;

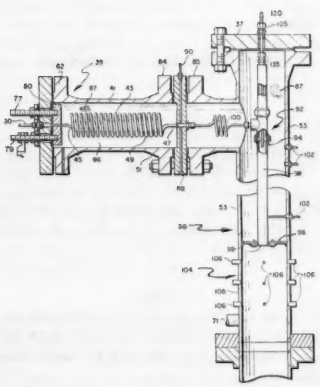
heating means for heating said hydrogen to a temperature several hundred degrees Fahrenheit above that of the carbonaceous material and that of the desired hydrogenation reaction temperature;

an unimpeded flow-through single reaction chamber defining a single reaction zone, said reaction zone providing for the unimpeded high-velocity entrained flow therethrough of said hot hydrogen and carbonaceous material and reaction products formed therefrom, said chamber having opposite ends and having a length sufficient to provide for a residence time of said hot hydrogen and pulverized carbonaceous material in said reaction zone substantially equal to a reaction time of up to about 500 milliseconds and having a cross-

sectional area sufficient to provide a high entrained flow cross-sectional throughput through said reaction zone of pulverized carbonaceous material in said hot hydrogen;

injector means adjacent one end of said reaction chamber, said injector means including (a) means for introducing said pulverized carbonaceous material into said reaction zone, (b) means for introducing said heated hydrogen into said reaction zone in an amount sufficient to rapidly heat said carbonaceous material to the desired hydrogenation reaction temperature in said reaction zone and at a high velocity of at least several hundred feet per second in excess of that of said





carbonaceous material and to ensure rapid and uniform mixing with said carbonaceous material and to provide said high entrained flow cross-sectional throughput through said reaction zone, and (c) insulating means for maintaining said heated hydrogen thermally separated from said carbonaceous material prior to said mixing to prevent agglomeration of said carbonaceous material; and

quenching means located adjacent the other end of said reaction chamber for rapidly quenching the reaction products exiting said reaction chamber to arrest said hydrogenation reaction.

4,323,539

APPARATUS FOR CONTINUOUSLY LEACHING ORE

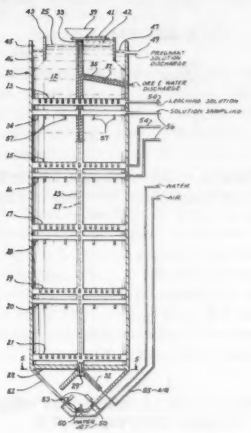
Richard E. Chilson, 8350 Tanque Verde Rd., Tucson, Ariz. 85715

Filed Sep. 12, 1975, Ser. No. 612,941

The portion of the term of this patent subsequent to Mar. 6, 1997, has been disclaimed.

Int. Cl.³ B01D *11/02*

U.S. Cl. 422—278 **6 Claims**



1. Apparatus for continuously leaching crushed ore comprising:

(a) a vertical columnar container for receiving crushed ore;

(b) means for continuously feeding said crushed ore to the top of said container;

(c) a plurality of stationary grid structures positioned at predetermined locations along said container, each grid structure extending across said container to contact the crushed ore and turbulate said crushed ore as it passes downwardly through the grid structure;

(d) a plurality of means positioned along said container at predetermined spaced intervals for introducing leaching reagents into said crushed ore as it passes downwardly through said grid structure;

(e) means positioned near the bottom of said container for continuously introducing rinsing liquid into said crushed ore, said rinsing liquid mixing with said reagents to form leaching solutions;

(f) means comprising a tubular passageway extending through the crushed ore from near the bottom of said container to the top of said container for continuously removing crushed ore from the bottom of said container; and

(g) means for continuously withdrawing said leaching solutions from the top of said container.

4,323,540

REDUCTION OF IRON PRECIPITATION IN URANIUM EXTRACTION PROCESS

Parameshwaran S. Sundar, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

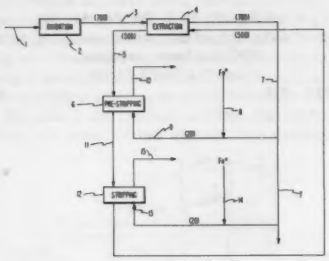
Filed Jan. 23, 1980, Ser. No. 114,467

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **10 Claims**

1. In a process for recovering uranium from a phosphoric acid liquor wherein uranium is oxidized from the +4 oxidation state to the +6 oxidation state with nitrate or nitrite ions and the +6 oxidation state uranium is extracted into an organic solvent and is then stripped from the organic solvent with an aqueous phosphoric acid solution containing Fe^{+2} ions, the improvement which comprises reducing or eliminating the

precipitation of iron when said uranium is stripped by pre-stripping with an aqueous phosphoric acid solution containing



sufficient Fe^{+2} ions to reduce nitrite and nitrate ions to nitrogen oxide gases but insufficient Fe^{+2} ions to precipitate uranium.

4,323,541

SELECTIVE TWO STAGE LEACHING OF NICKEL FROM NICKEL-COPPER MATTE

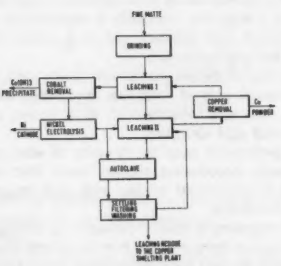
Heimo U. A. Saarinen, and Matti Seilo, both of Harjavalta, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jun. 18, 1980, Ser. No. 160,503

Claims priority, application Finland, Jun. 29, 1979, 792057

Int. Cl.³ C25C *1/06*; C22B *15/14*

U.S. Cl. 423—37 **9 Claims**



1. A process for selective leaching of nickel-copper matte comprising:

(a) first leaching a finely-ground nickel-copper matte using an acid at a minimum temperature of approximately 80° C. and under oxidizing conditions in order to produce a nickel sulfate solution and a nickel-copper sulfide residue, which is separated from the solution and

(b) thereafter leaching the nickel-copper sulfide residue using acid in an autoclave at a minimum temperature of 110° C. and under oxidizing conditions in order to produce an additional quantity of nickel sulfate solution and a copper sulfide precipitate

(c) directing the nickel sulfate solution obtained from the autoclave solution of stage (b) to the leaching of stage (a) and

(d) directing leach residue from stage (b) containing primarily said copper sulfide precipitate to a copper smelting plant.

4,323,542

CATALYTIC CONVERSION OF CARBON MONOXIDE, HYDROCARBONS AND OXIDES OF NITROGEN

George C. Joy, III, Alrington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 52,647, Jun. 27, 1979, abandoned. This application Aug. 8, 1980, Ser. No. 176,831

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—213.5 **8 Claims**

1. A process for the oxidation of carbon monoxide, the oxidation of hydrocarbons, and the reduction of oxides of nitrogen contained in a sulfur-dioxide containing gas from an internal combustion engine which comprises contacting said gas at a temperature above 200° C. with a catalytic composite comprising rhodium, uranium, and one or more metals selected from the group consisting of platinum and palladium, dispersed on a high surface area refractory inorganic oxide.

4,323,543

SORPTION OF GASES

Charles A. McAuliffe, Altrincham; William Levason, Southampton, and Francis P. McCullough, Cheedleholm, all of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 16,081, Feb. 28, 1979, Pat. No. 4,251,452. This application May 16, 1980, Ser. No. 150,586

Claims priority, application United Kingdom, Mar. 3, 1978, 08547/78; Sep. 25, 1978, 37949/78

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—219 **16 Claims**

1. A method for the separation of a gas from a fluid containing said gas, comprising the step of treating said fluid with a compound of formula I whereby said gas is absorbed by said compound, wherein said gas is oxygen, hydrogen, carbon monoxide, sulfur dioxide, or an alkene, and wherein said formula I is

$$Mn^{II}LX_2 \qquad \text{I}$$

wherein L represents a ligand of the formula IA,

$$PR^1R^2R^3 \qquad \text{IA}$$

wherein R^1, R^2, and R^3 independently represent alkyl, cycloalkyl, or aryl groups or hydrogen, with the proviso that no more than two of the groups R^1, R^2, and R^3 are aryl groups and that at least one of the groups R^1, R^2, and R^3 is an alkyl, cycloalkyl, or aryl group, and wherein X, which is a species capable of existing as an anion, represents —Cl, —Br, —I, —CN, —NO_2, —NO_3, —OH, —NCS, or —NCO.

4,323,544

PROCESS AND SORBENT SYSTEM FOR REMOVING NITROGEN AND OTHER OXIDES FROM GAS STREAMS

Jules Magder, Princeton, N.J., assignor to Noxso Corporation, Reston, Va.

Continuation of Ser. No. 54,337, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 945,769, Sep. 25, 1978, abandoned, and a continuation of Ser. No. 871,920, Jan. 23, 1978, abandoned, which is a continuation of Ser. No. 745,944, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 625,275, Oct. 23, 1975, abandoned, which is a continuation of Ser. No. 444,191, Feb. 15, 1974, abandoned, which is a division of Ser. No. 236,483, Jun. 16, 1972, abandoned. This application Apr. 28, 1980, Ser. No. 144,078

Int. Cl.³ C01B *53/34*

U.S. Cl. 423—239 **62 Claims**

1. A method for removing sulfur oxides and nitrogen oxides from a sorbent comprising alumina having a surface area of at least 20 square meters per gram and an alkaline component comprising an oxide, hydroxide or salt of a Group IA or IIA metal of atomic number not exceeding 56 which sorbent contains both sulfur oxides and nitrogen oxides which comprises:

(a) contacting said sulfur oxide and nitrogen oxide-containing sorbent in a regeneration zone with a regenerant gas stream containing at least 0.01 atmosphere partial pressure of hydrogen sulfide at a temperature of about 350° to about 750° C. for a period of time sufficient to recover a substantial portion of the sorbent's capacity for nitrogen oxide and sulfur oxide sorption;

(b) withdrawing nitrogen oxide formerly contained on said sorbent in the form of elemental nitrogen, or a non-polluting nitrogen compound; and

(c) withdrawing sulfur oxides formerly contained on said sorbent in the form of elemental sulfur.

4,323,545

DENSE ALUMINA WITH A PRIMARY RECRYSTALLIZED POLYCRYSTALLINE STRUCTURE AND CRYSTAL ORIENTATION

David J. Sellers, Pepperell; William H. Rhodes, Lexington, and Thomas Vasilos, Winthrop, all of Mass., assignors to Avco Corporation, Wilmington, Mass.

Continuation of Ser. No. 700,297, Jun. 28, 1976, abandoned. This application Feb. 14, 1977, Ser. No. 768,062

Int. Cl.³ C01F *7/02*

U.S. Cl. 423—625 **3 Claims**

1. An article of manufacture, a high density polycrystalline alumina body consisting essentially in excess of 99.90 percent pure alumina having a primary recrystallized grain structure with the "c" axis of the grains being aligned parallel to one another and said alignment being caused by plastic deformation of the alumina grains.

4,323,546

METHOD AND COMPOSITION FOR CANCER DETECTION IN HUMANS

David R. Crockford, Haverhill, Mass., and Buck A. Rhodes, Albuquerque, N. Mex., assignors to Nuc Med Inc., Albuquerque, N. Mex. and University Patents Inc, Norwalk, Conn.

Continuation-in-part of Ser. No. 908,568, May 22, 1978, abandoned. This application May 14, 1979, Ser. No. 37,992

Int. Cl.³ A61K *49/00, 43/00;* G01T *1/00;* B65D *71/00*

U.S. Cl. 424—1 **12 Claims**

1. A composition of matter selected from the group consisting of Technetium-99m labeled anti-human chorionic gonadotropin, Technetium-99m labeled anti-human chorionic gonadotropin-beta and/or mixtures thereof.

10. The method of detecting cancer cells and/or a malignant tumor in a human which comprises injecting the composition of claim **1** into the human and scanning the human by scintigraphy, a means for detecting gamma radiation from said composition within the body of said human.

4,323,547

LABELED FATTY ACIDS AND METHOD OF MAKING AND USING SAME

Ernst J. Knust, Jülich; Christiane Kupfernagel, Aachen, and Gerhard Stöcklin, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Jun. 28, 1979, Ser. No. 52,965

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828623

Int. Cl.³ A61K *43/00, 49/00;* G01T *1/00*

U.S. Cl. 424—1 **15 Claims**

1. An ^{18}F labeled fatty acid, particularly for investigation into the kinetics of heart muscle metabolism containing at least one positron-emitting ^{18}F atom at the ω terminal or at least at one position along the chain substantially central of the α and ω terminals.

5. In a method of investigating heart muscle metabolism by a noninvasive process, the improvement which comprises administering to the subject an ^{18}F labeled fatty acid as defined in claim **1**.

4,323,548

VAGINAL SUPPOSITORY FOR CONTRACEPTION, HAVING A PREDETERMINED LACTALBUMIN CONTENT

Arthur Scherm, Bad Homburg, Fed. Rep. of Germany, assignor to Merz & Co., Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 893,187, Apr. 3, 1978, abandoned, which is a continuation of Ser. No. 692,859, Jun. 4, 1976, abandoned. This application Dec. 22, 1978, Ser. No. 972,228

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602297

Int. Cl.³ A61K *9/00, 31/09*

U.S. Cl. 424—44 **7 Claims**

1. A foam-producing vaginal suppository consisting essentially of about 65 to about 85 percent by weight of a solid water-soluble polyethylene glycol material which melts at body temperature, having dispersed therein minor amounts of a spermicide, about 10 to about 20 percent by weight of a foaming agent comprising a mixture of a water-soluble bicarbonate and a solid weak acid, operative when the suppository is dissolved in aqueous medium to generate a foam-forming gas, and a foam-stabilizing agent, characterized in that the foam-stabilizing agent comprises about 2 to about 4 percent by weight of a surfactant, which is effective to reduce the surface tension of water to less than 45 dynes per centimeter, and lactalbumin in an amount ranging from that amount which is effective to impart increased stability to the foam produced up to and not more than about 10 percent by weight.

4,323,549

ANTI-SOLAR COSMETIC COMPOSITION

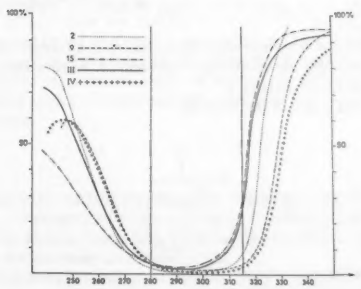
Claude Bouillon, Eaubonne; Charles Vayssie, Aulnay-sous-Bois, and Francoise Richard, Montreuil-sous-Bois, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 497,469, Aug. 14, 1974, Pat. No. 4,165,336, and a continuation-in-part of Ser. No. 440,570, Feb. 7, 1974, abandoned. This application Jan. 30, 1976, Ser. No. 653,957

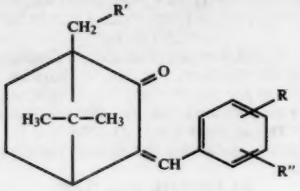
Claims priority, application Luxembourg, Feb. 19, 1973, 67061

Int. Cl.³ A61L *9/04;* A61K *7/42*

U.S. Cl. 424—45 **31 Claims**



1. A cosmetic composition which absorbs ultraviolet rays in the zone ranging from 280 to 315 millimicrons and which transmits ultraviolet rays from 315 millimicrons to 400 millimicrons comprising a solution or suspension of a U. V. absorbing effective amount of an anti-solar agent of the formula



wherein R represents a member selected from the group consisting of hydrogen, halogen selected from the group consisting of chlorine and fluorine and alkyl containing 1 to 4 carbon atoms; R′ and R″ each independently represent a member selected from the group consisting of hydrogen and SO_3M wherein M represents a member selected from the group consisting of hydrogen, organic ammonium group and a metal, wherein at least one of R′ and R″ is other than hydrogen and R″ is a substituent at the para or meta position relative to the bornylidene ring.

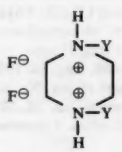
4,323,550

HALOGENOHYDRATES OF N,N-DISUBSTITUTED DERIVATIVES OF PIPERAZINE HAVING ANTICARIOGENIC PROPERTIES

Jean-Jacques Goupil, 30 Ave du President Wilson, Cachan, France (94230)

Filed Feb. 17, 1977, Ser. No. 769,588
Claims priority, application France, Feb. 19, 1976, 76 04546
Int. Cl.[3] A61K *7/18;* C07D *295/08*
U.S. Cl. 424—52 **11 Claims**

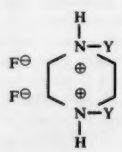
1. An orally administrable pharmaceutical dosage form comprising from about 0.66 to 13% by weight of a compound of the formula



wherein Y is a member selected from the group consisting of hydroxyalkyl, dihydroxyalkyl and epoxyalkyl wherein alkyl is C_2–C_4 and from about 87 to about 99.66% by weight of a carrier material.

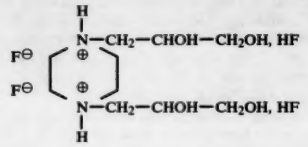
2. A method for preventing dental caries in a human which comprises orally administering to said human the pharmaceutical dosage form of claim 1.

6. A compound of the formula

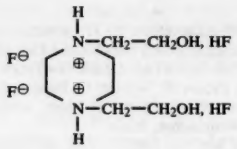


where Y is a member selected from the group consisting of hydroxyalkyl, dihydroxyalkyl and epoxyalkyl wherein alkyl is C_2–C_4.

10. N,N′-di(hydroxy-propyl) piperazine tetrafluorohydrate of the formula



11. N,N′-di(hydroxy-ethyl) piperazine tetrafluorohydrate of the formula



4,323,551

MOUTHWASH COMPOSITIONS

John J. Parran, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 19, 1981, Ser. No. 235,873
Int. Cl.[3] A61K *7/16, 7/22*
U.S. Cl. 424—54 **10 Claims**

1. A mouthwash composition comprising:

(A) from about 0.02% to 0.20% of a quaternary ammonium compound;

(B) an amount of a tetra-alkali metal pyrophosphate salt sufficient to provide from about 0.5% to 5% of the $P_2O_7^{-4}$ species; and

(C) a carrier liquid

wherein the pH of said composition is adjusted to the range of from about 7.0 to 9.5 with a mineral or organic acid.

4,323,552

HIGH FOAMING DENTIFRICE COMPOSITIONS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 11, 1981, Ser. No. 262,315
Int. Cl.[3] A61K *7/16, 7/22*
U.S. Cl. 424—54 **9 Claims**

1. A dentifrice comprising a nonionic surfactant and an effective amount of a cationic anti-decay agent, said nonionic surfactant being a cogeneric mixture of conjugated polyoxybutylene-polyoxyethylene compounds containing in their structure oxybutylene groups, oxyethylene groups and an organic radical derived from a water-soluble organic compound containing a plurality of reactive hydrogen atoms and 2 to 12 carbon atoms; the compounds being characterized in that all of the oxybutylene groups are present in polyoxybutylene chains that are attached to the organic radical at the site of a reactive hydrogen atom thereby constituting a polyoxybutylene polymer; the oxyethylene groups being attached to the polyoxybutylene polymer in polyoxyethylene chains; the average molecular weight of the polyoxybutylene polymers in the mixture being at least 500, as determined by hydroxyl number, and the oxyethylene groups present constituting 60 to 85 percent, by weight, of the mixture.

4,323,553

COMPOSITION FOR STRENGTHENING AND REVITALIZING BRITTLE OR DAMAGED NAILS CONTAINING A SALT OF 2-BENZYLTHIO ETHYLAMINE

Claude Bouillon, Eaubonne, and Patrick Darmenton, Villejuif, both of France, assignors to L'Oreal, Paris, France

Filed Apr. 29, 1980, Ser. No. 144,872
Claims priority, application France, May 3, 1979, 79 11115
Int. Cl.[3] A61K 7/04
U.S. Cl. 424—61 8 Claims

1. A process for strengthening and revitalizing brittle or damaged nails comprising applying to the surface of the nails an effective amount of a composition comprising in a cosmetic vehicle from 0.05 to 5 weight percent of a mineral or organic acid salt of 2-benzylthio ethylamine having the formula

$$C_6H_5—CH_2—S—CH_2—CH_2NH_2.$$

4,323,554

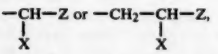
PREPARATION AND USE OF IMPROVED PEARLESCENT PIGMENTS OF HIGH LIGHT FASTNESS

Horst Bernhard, Reinheim, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,598
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928287
Int. Cl.[3] A61K 7/021; C09C 1/00, 3/08, 3/10
U.S. Cl. 424—63 9 Claims

1. A colored material-containing pearlescent pigment comprising mica flakes coated with a metal oxide, the colored material being a colored aluminum lake which is fixed as a water-insoluble compound on the surface of the pigment particles, the lake being formed by a precipitated aluminum hydroxide layer, wherein the aluminum hydroxide layer forming the colored lake contains an amount in the range of 1 to 50% by weight, sufficient to increase the light fastness of said pigment, of a compound of the formula

wherein X is hydroxy or carboxy; Y is hyrdrogen, or alkyl or alkenyl of 10 to 20 carbon atoms; and Z is hydrogen, alkyl or alkenyl of 10 to 20 carbon atoms, or the grouping



the compound having a molecular weight of at least 150 and a solubility in water at a pH of 5–9 of at least 0.05 g/l, and the compound being precipitated onto the metal oxide coated mica flakes together with the aluminum hydroxide layer.

9. A cosmetic composition containing an amount of the pigment of claim 1 sufficient to alter the appearance of the composition and a cosmetically acceptable carrier.

4,323,555

METHOD OF PROTECTING CATTLE AND SHEEP AGAINST BOVINE LEUKEMIA VIRUS AND VACCINES FOR USE THEREIN

Gordon H. Theilen, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 3, 1980, Ser. No. 203,062
Int. Cl.[3] A61K 39/00; C12N 5/02
U.S. Cl. 424—88 10 Claims

1. The method of protecting cattle or sheep against bovine leukemia virus (BLV), comprising culturing lymphoid cells in vitro obtained from bovine or ovine lymphosarcoma tissue, continuing said culturing until a cell line is established capable of successive in vitro propagation, which cell line is characterized by being a non-producer of BLV, propagating said cells in vitro, harvesting the propagated cells, and preparing a parenteral vaccine therefrom for administration to cattle or sheep.

4,323,556

SOLID FORMULATIONS CONTAINING PHEROMONES AND METHOD OF USING SAME

Anacleto Dal Moro; Franco Pinamonti, and Amedeo Capizzi, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 210,727, Nov. 26, 1980, abandoned. This application May 26, 1981, Ser. No. 267,059
Claims priority, application Italy, Jan. 23, 1980, 19390 A/80
Int. Cl.[3] A01N 17/14
U.S. Cl. 424—84 16 Claims

1. A solid formulation consisting of: a sex insect pheromone as an active substance, supported on an inert material coated with a film-forming resin, a wetting agent, a dispersant and a sticker, an ultraviolet stabilizer, and an antioxidant, and having the following composition, the quantities being in percent by weight:

A	Active substance - sex pheromone	0.5–10
B	Film-forming resin selected amongst terpene polymers, chlorinated natural rubber or carboxylated polyvinylalcohol	5–30
C	Mixture of a polyoxyethylated alkyl phenol (1–10% b.w.), sodium polymethacrylate (50–94% b.w.) and sodium lignosulphonate (5–40% b.w.), the total being 100%	5–15
D	U.V. Stabilizer consisting of derivatives of benzophenone having stabilizing properties	0.5–10
E	Antioxidant selected amongst the esters of 3-(3,5-di-tert.butyl-4-hydroxy-phenyl)-propionic acid with stearic alcohol or with pentaerithritol (tetrakis ester)	0.5–10
F	Inert carrier consisting essentially of a material selected amongst fossil meal, kaolin, attapulgite and talc	to 100%.

4,323,557

PRESSURE-SENSITIVE ADHESIVE CONTAINING IODINE

Paul D. Rosso, St. Joseph Township, St. Croix County, Wis., and Michael Y. Moss, St. Paul, Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Jul. 31, 1979, Ser. No. 62,362
Int. Cl.[3] A61K 9/70; A61F 13/00; A61L 15/03; A61K 31/79
U.S. Cl. 424—28 8 Claims

1. In a process for making a composition which exhibits antiseptic broad-spectrum antimicrobial activity when placed in contact with the skin, the improvement comprising forming a solution of an iodide, a solvent and iodine, and reacting said solution with a dermatologically acceptable pressure-sensitive adhesive.

4,323,558

TOPICAL TRIEN CONTAINING PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

Eric L. Nelson, Santa Ana, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

Continuation-in-part of Ser. No. 73,932, Sep. 10, 1979, abandoned. This application Aug. 7, 1980, Ser. No. 176,076
Int. Cl.[3] A61K 33/04, 31/13
U.S. Cl. 424—164 16 Claims

1. A therapeutic composition limited to topical Application to the body comprising an effective anti-inflammatory amount of trien and a pharmaceutically acceptable topical carrier

selected from the group consisting of gels, ointments and lotions.

4,323,559

COMPOUNDS DERIVED FROM N-ACETYL-NOR-MURAMYL-L-ALANYL-D-ISO-GLUTAMIC ACID AND OTHER COMPOUNDS AND BIOLOGICALLY ACTIVE COMPOSITIONS CONTAINING SUCH COMPOUNDS

Francoise Audibert, Neuilly-Sur-Seine, and Pierre Lefrancier, Bures-Sur-Yvette, both of France, assignors to Agencie Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

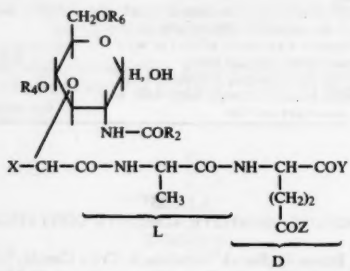
Continuation of Ser. No. 914,073, Jun. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 516,991, Oct. 22, 1974, Pat. No. 4,186,194. This application Mar. 31, 1980, Ser. No. 135,928

Claims priority, application France, Oct. 23, 1973, 73 37806; Jul. 1, 1974, 74 22909

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **7 Claims**

1. A biological composition which comprises a biologically acceptable carrier and, in a biologically effective amount, a water-soluble, biologically active compound which is an adjuvant and anti-bacterial in vivo of the formula:



wherein X is hydrogen,

R_2 is methyl, R_4 is hydrogen R_6 is hydrogen and Y is amino when Z is hydroxyl, or Y is methoxy when Z is methoxy.

4,323,560

NOVEL PHOSPHORYLMURAMYL PEPTIDES AND PROCESSES FOR THE MANUFACTURE THEREOF

Gerhard Baschang, Bettingen, Switzerland; Lajos Tarcsay, Grenzach-Wyhlen; Albert Hartmann, Grenzach, both of Fed. Rep. of Germany, and Jaroslav Stanek, Birsfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

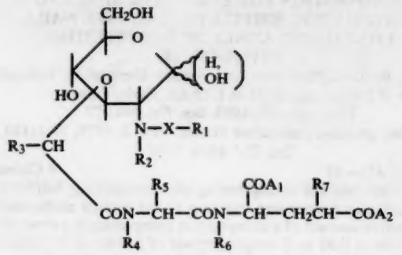
Filed Oct. 6, 1980, Ser. No. 194,104

Claims priority, application Switzerland, Oct. 12, 1979, 9219/79

Int. Cl.[3] **A61K** *37/00, 37/02;* **C07C** *103/52*

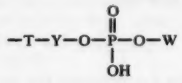
U.S. Cl. 424—177 **18 Claims**

1. Phosphorylmuramyl peptides of the formula



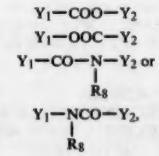
(I)

in which X represents carbonyl, R_1 represents lower alkyl unsubstituted or substituted by hydroxy, lower alkoxy or halogen, or represents phenyl unsubstituted or substituted by hydroxy, lower alkoxy, lower alkyl or halogen, R_2, R_4 and R_6 independently of one another represent hydrogen or lower alkyl, R_3 represents hydrogen or lower alkyl, R_5 represents hydrogen, lower alkyl having from 1 to 3 carbon atoms unsubstituted or substituted by hydroxy, lower alkoxy, mercapto, lower alkylthio, amino or halogen, or represents cycloalkyl or cycloalkyl-lower alkyl in which the lower alkyl radical contains from 1 to 3 carbon atoms, and in each of which the cycloalkyl radical contains from 4 to 6 carbon atoms, phenyl or phenyl-lower alkyl having from 1 to 3 carbon atoms in the lower alkyl radical and each unsubstituted or substituted by hydroxy, lower alkoxy or halogen, or heterocyclyl or heterocyclyl-lower alkyl having from 1 to 3 carbon atoms in the lower alkyl radical, and each containing one or two nitrogen atoms and having 5 or 6 ring members, or R_4 and R_5 together alternatively represent alkylene having 3 to 4 carbon atoms, R_7 represents hydrogen, and one of the radicals A_1 and A_2 represents a radical of the formula



(II)

in which T represents HN or O, Y represents lower alkylene which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, mercapto, lower alkylthio, lower alkanoylthio, amino-lower alkyl, mono- or di-lower alkylamino-lower alkyl, lower alkanoylamino-lower alkyl, aminocarbonyl, lower alkyl, cycloalkyl having 5 or 6 carbon atoms, a phenyl or a phenyl lower alkyl radical, or by heterocyclyl or heterocyclyl-lower alkyl having from 1 to 3 carbon atoms in the lower alkyl radical and each containing one or two nitrogen atoms and having 5 or 6 ring members or a radical of one of the formulae



(IIIa)
(IIIb)
(IIIc)
(IIId)

in which Y_1 and Y_2 each represents lower alkylene which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, mercapto, lower alkylthio, lower alkanoylthio, amino-lower alkyl, mono- or di-lower alkylamino-lower alkyl, lower alkanoylamino-lower alkyl, aminocarbonyl, lower alkyl, cycloalkyl having 5 or 6 carbon atoms, a phenyl or a phenyl lower alkyl radical, or by heterocyclyl or heterocyclyl-lower alkyl having from 1 to 3 carbon atoms in the lower

alkyl radical and each containing one or two nitrogen atoms and having 5 or 6 ring members and R_8 represents hydrogen, W represents an alkyl or alkenyl group having from 7 to 30 carbon atoms which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, amino, lower alkylamino, lower alkanoylamino or oxo or represents a cycloalkyl or cycloalkenyl radical having from 10 to 30 carbon atoms which is unsubstituted or substituted by one or more alkyl radicals having from 1 to 8 carbon atoms, and the other of the radicals A_1 and A_2 represents hydroxy, lower alkoxy, amino or lower alkylamino, or represents aminocarbonyl-lower alkylamino unsubstituted or substituted in the lower alkyl radical by hydroxy, carboxy or amino groups, and salts thereof.

18. A method for modulating the immune response of a warm-blooded animal including man, which comprises administering to said animal an effective amount of a compound of claim **1**.

4,323,561

PROCESS OF ENHANCING IMMMUNOGENIC RESPONSE IN MAMMALS BY THE ADMINISTRATION OF SYNTHETIC GLYCOLIPID ADJUVANTS

Alois H. Nowotny, Abington, Pa., assignor to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Sep. 6, 1977, Ser. No. 830,681
Int. Cl.³ A61K *31/70*; C07H *5/06*
U.S. Cl. 424—180 **4 Claims**

1. The method of enhancing the immunogenic response of a mammal which comprises administering to a mammal parenterally before or at the time of administration of an immunogen a mixture of the immunogen and an effective amount of an N-acylated-D-glucosamine selected from the group consisting of N-lauroyl-D-glucosamine, N-myristoyl-D-glucosamine, N-stearoyl-D-glucosamine, N-palmitoyl-D-glucosamine, N-caprylyl-D-glucosamine and N-capryl-D-glucosamine.

4,323,562

ADJUVANT FOR STIMULATING PRODUCTION OF LYMPHOCYTES

Dae-Eun Kim, 545-90, 6-dong, Anyang City, Kyonggi-do, Rep. of Korea

Filed Jul. 16, 1980, Ser. No. 169,324
Claims priority, application Rep. of Korea, Jul. 27, 1979, 2546
Int. Cl.³ A61K *35/78*
U.S. Cl. 424—195 **1 Claim**

1. A method for stimulating the production of lymphocytes in the circulating blood of a mammal, which comprises:

administering to the mammal an adjuvant in an amount effective to stimulate the lymphatic system to elevate the number of lymphocytes in the blood, said adjuvant being a water-soluble, diethyl ether-soluble, unsaponified, fraction of Atractylis lyrata s. et z.

4,323,563

FAT EMULSION FOR INTRAVENOUS INJECTION

Toru Takami, Yokosuka; Misako Takezawa, Yokohama; Hiroyuki Ohashi, and Shigeru Takeda, both of Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 30, 1979, Ser. No. 89,498
Claims priority, application Japan, Oct. 31, 1978, 53-134279
Int. Cl.³ A61K *31/685*; C07F *9/02, 9/10*; C11C *3/00*
U.S. Cl. 424—199 **20 Claims**

1. An emulsifier comprising purified phospholipid of soybean origin, containing less than 5% of glycolipid by weight, and having a degree of hydrogenation of 30–50 as defined by the iodine number.

7. A fat emulsion for intravenous injection comprising a fatty oil, water and the emulsifier of claim **1**.

20. A process for preparing a purified emulsifier of soybean origin comprising:

(1) isolating a phosphatidylcholine fraction from a phospholipid of soybean origin;

(2) partially hydrogenating said isolated phosphatidylcholine fraction; and

(3) removing glycolipid from said hydrogenated phosphatidylcholine fraction.

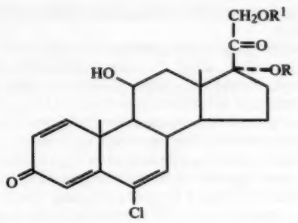
4,323,564

ESTERS OF 6-CHLORO-11β, 17α,21-TRIHYDROXYPREGNA-1,4,6-TRIENE-3,20-DIONE

John H. Fried, Palo Alto; Denis J. Kertesz, Mountain View, and Michael Marx, Sunnyvale, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 791,911, Apr. 24, 1977, abandoned. This application Mar. 9, 1978, Ser. No. 884,933
Int. Cl.³ A61K *31/58*; C07J *5/00*
U.S. Cl. 424—241 **8 Claims**

1. A compound chosen from those represented by the formula

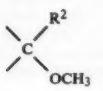


(I)

wherein

R is butyryl or benzoyl when R^1 is hydrogen, or R is butyryl when R^1 is butyryl, or

R and R^1 taken together are represented by



(II)

wherein

R^2 is propyl or phenyl.

8. A method of relieving a topical inflammatory condition in mammals which comprises contacting the afflicted area with an effective amount of a compound of claim **1**.

4,323,565

ANTIBACTERIAL AND ANTIFUNGAL COMPOSITION

Masayasu Hasegawa, Kyoto; Hideo Nishikawa, Ibaraki, and Kayoko Yoshida, Takatsuki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 58,446, Jul. 18, 1979, Pat. No. 4,242,336. This application May 20, 1980, Ser. No. 151,651
Claims priority, application Japan, Jul. 31, 1978, 53-93878; Aug. 2, 1978, 53-94785
The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.
Int. Cl.³ A01N *43/02, 43/40, 43/88, 55/02*
U.S. Cl. 424—246 **1 Claim**

1. An antibacterial and antifungal composition comprising a mixture of:

(A) at least one member selected from the group consisting of dehydroacetic acid, and its alkali metal salts; and

(B) tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione, wherein the weight ratio of component (A) to component (B) is in the range of 95/5 to 60/40.

4,323,566

TRIAZOLE ACYLAMINES, PHARMACEUTICAL COMPOSITIONS THEREOF AND METHOD OF USE THEREOF

John W. Clitherow, Sawbridgeworth; Barry J. Price, Hertford; John Bradshaw; Michael Martin-Smith, both of Ware; John W. M. MacKinnon, Royston; Duncan B. Judd, Ware, and Linda Carey, Royston, all of England, assignors to Glaxo Group Limited, London, England

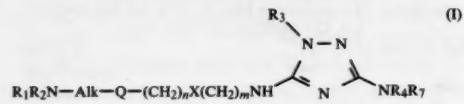
Filed Feb. 29, 1980, Ser. No. 125,847

Claims priority, application United Kingdom, Mar. 2, 1979, 07421/79

Int. Cl.[3] **C07D** *403/12;* **A61K** *31/41;* **C07D** *403/14*

U.S. Cl. 424—248.51 **18 Claims**

1. A compound of the formula (I)



(I)

and physiologically acceptable acid addition salts and hydrates thereof, in which

R_1 and R_2 which may be the same or different, each represent hydrogen, C_{1-10} alkyl, C_{3-18} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, phenyl C_{1-6} alkyl, substituted phenyl C_{1-6} alkyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms; trifluoro C_{1-6} alkyl, or C_{1-6} alkyl substituted by hydroxy, C_{1-6} alkoxy, amino, C_{1-6} alkylamino, di-C_{1-6} alkylamino or C_{3-8} cycloalkyl or R_1 and R_2 may together with the nitrogen atom to which they are attached form a heterocyclic ring which is pyrrolidine, piperidine optionally substituted in the 4-position by methyl or hydroxy, tetrahydropyridine, morpholine, 2,6-dimethylmorpholine, hexamethyleneimine or heptamethyleneimine;

Alk represents a straight or branched alkylene chain of 1 to 6 carbon atoms;

Q represents a furan or thiophene ring in which incorporation into the rest of the molecule is through bonds at the 2- and 5-positions, the furan ring optionally bearing a further substituent R_6 adjacent to the group R_1R_2N-Alk-, or Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1- and 3- or 1- and 4-positions;

R_6 represents halogen or C_{1-4} alkyl which may be substituted by hydroxy or C_{1-4} alkoxy;

X represents $—CH_2—$, —O—, —S— or

where R_5 represents hydrogen or methyl;

n represents zero, 1 or 2;

m represents 2, 3 or 4;

R_3 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, phenyl C_{1-6} alkyl, substituted phenyl C_{1-6} alkyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms; hydroxy C_{2-6} alkyl; C_{1-6} alkoxy C_{1-6} alkyl, or phenyl, substituted phenyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms; and

R_4 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl or phenyl C_{1-6} alkyl, substituted phenyl C_{1-6} alkyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms, and R_7 represents the group COR_8 where R_8 represents hydrogen, C_{1-6} alkyl, phenyl, substituted phenyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms; phenyl C_{1-6} alkyl, substituted phenyl C_{1-6} alkyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms; C_{1-6} alkoxy, heteroaryl, wherein said heteroaryl is furyl, pyridyl, thiazolyl, quinolinyl, indolyl or thienyl; or monocyclic heteroaryl C_{1-6} alkyl wherein said monocyclic heteroaryl portion is furyl, pyridyl, thiazolyl, or thienyl, or R_7 represents the group SO_2R_9 where R_9 represents C_{1-6} alkyl or phenyl, substituted phenyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms, or R_7 represents the group

where Y is oxygen or sulphur and R_{10} represents hydrogen,, C_{1-6} alkyl, C_{3-8} cycloalkyl, phenyl, substituted phenyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms, or phenyl C_{1-6} alkyl, substituted phenyl C_{1-6} alkyl wherein said substituent is at least one C_{1-3} alkyl or C_{1-6} alkoxy groups or halogen atoms.

18. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as defined in claim 1 to relieve said condition.

4,323,567

ARYLMALONAMIDO-1-OXADETHIACEPHALOSPORINS

Masayuki Narisada, Ibaraki, and Wataru Nagata, Nishinomiya, both of Japan

Continuation of Ser. No. 41,630, May 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 959,784, Nov. 13, 1978, Pat. No. 4,180,571, which is a division of Ser. No. 780,183, Mar. 22, 1977, Pat. No. 4,138,486. This application Jun. 5, 1980, Ser. No. 156,872

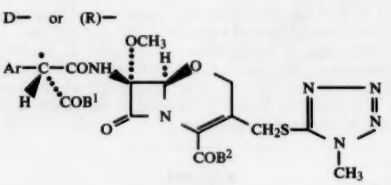
Claims priority, application Japan, Mar. 25, 1976, 51-33401; Apr. 30, 1976, 51-50295

The portion of the term of this patent subsequent to Feb. 6, 1996, has been disclaimed.

Int. Cl.[3] **C07D** *413/14;* **A61K** *31/41;* **C07D** *413/12;* **A61K** *31/535*

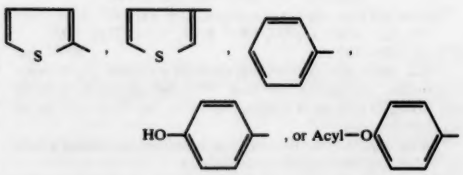
U.S. Cl. 424—248.51 **59 Claims**

1. A substantially pure compound of the following formula:



wherein

Ar is



in which Acyl is alkanoyl containing 1 to 5 carbon atoms,

carbamoyl, N-alkylcarbamoyl containing 2 to 6 carbon atoms, or ureidocarbonyl, and

COB^1 and COB^2 each independently represent carboxy, methoxycarbonyl, ethoxycarbonyl, isopropoxycarbonyl, n-butoxycarbony, t-butoxycarbonyl, pentyloxycarbonyl, cyclopropylmethoxycarbonyl, monohydroxy-t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, chloromethoxycarbonyl, cyanomethoxycarbonyl, methanesulfonylethoxycarbonyl, acetylmethoxycarbonyl, acetoxymethoxycarbonyl, acetoxyethoxycarbonyl, propionyloxymethoxycarbonyl, propionyloxyethoxycarbonyl, pivaloyloxymethoxycarbonyl, benzoyloxymethoxycarbonyl, methoxymethoxycarbonyl, phenoxymethoxycarbonyl, methylthiomethoxycarbonyl, phenylthiomethoxycarbonyl, tetrahydropyranyloxy carbonyl, phthaliminomethoxycarbonyl, α,α-dimethylpropargyloxycarbonyl, methoxycarbonyloxyethoxycarbonyl, ethoxycarbonylethoxycarbonyl, methoxycarbonyloxypropoxycarbonyl, allyloxycarbonyl, benzyloxycarbonyl, phenethyloxycarbonyl, tolylmethoxycarbonyl, dimethylbenzyloxycarbonyl, nitrobenzyloxycarbonyl, halobenzyloxycarbonyl, methoxybenzyloxycarbonyl, phthalidyloxycarbonyl, p-hydroxy-di-t-butylbenzyloxycarbonyl, diphenylmethoxycarbonyl, trityloxycarbonyl, phenacyloxycarbonyl, chlorophenacyloxycarbonyl, bromophenacyloxycarbonyl, nitrophenacyloxycarbonyl, methylphenacyloxycarbonyl, trimethylsilyloxycarbonyl, dimethylmethoxysilyloxycarbonyl, trimethylstannyloxycarbonyl, phenoxycarbonyl, naphthyloxycarbonyl, tolyloxycarbonyl, dimethylphenoxycarbonyl, nitrophenoxycarbonyl, methoxyphenoxycarbonyl, methanesulfonylphenoxycarbonyl, chlorophenoxycarbonyl, pentachlorophenoxycarbonyl, indanyloxycarbonyl, pyridyloxycarbonyl, sodiooxycarbonyl, potassiooxycarbonyl, magnesiooxycarbonyl, calcioxycarbonyl, or a salt of carboxy group with procain, xylocain, triethylamine, or dicyclohexylamine.

46. A method for treating human or veterinary bacterial infection which comprises administering to a human or veterinary subject suffering from such infection an antibacterially effective amount of a compound according to claim **1**.

4,323,568
PHARMACEUTICALLY ACTIVE (OMEGA-AMINOALKOXY)BIBENZYLS

Kyoji Kikumoto, Machida; Kunihiro Ninomiya; Harukazu Fukami, both of Yokohama, and Hiroto Hara, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Division of Ser. No. 943,621, Sep. 19, 1978, Pat. No. 4,220,603. This application Dec. 6, 1979, Ser. No. 100,741

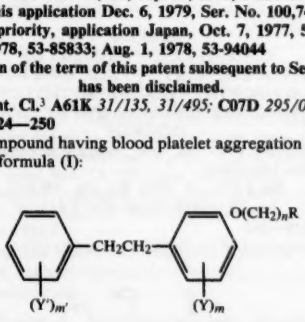
Claims priority, application Japan, Oct. 7, 1977, 52-120710; Jul. 14, 1978, 53-85833; Aug. 1, 1978, 53-94044

The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.

Int. Cl.[3] **A61K** *31/135, 31/495;* **C07D** *295/08*

U.S. Cl. 424—250 **14 Claims**

1. A compound having blood platelet aggregation inhibitory effects of formula (I):



wherein R is (1) —N—R_1R_2, R_1 and R_2 which are alike or different are selected from the group consisting of hydrogen, C_1–C_8 alkyl and C_1–C_8 hydroxyalkyl or (2) a heterocyclic group selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, C_6–C_8 4-alkyl-1-piperazinyl and C_6–C_8 4-ω-hydroxyalkyl-1-piperazinyl or said heterocyclic group substituted by one or two substituents selected from the group consisting of carboxyl, C_2–C_4 alkoxycarbonyl, carbamoyl, C_3–C_6 N,N-dialkylcarbamoyl, C_2–C_4 N-alkylcarbamoyl, C_1–C_3 alkyl and hydroxyl; each of the Y radicals and Y' radicals being hydrogen, halogen, C_1–C_5 alkyl, hydroxyl, C_1–C_5 alkoxy, carboxyl, C_2–C_6 alkoxycarbonyl or —NR_9R_{10}, wherein R_9 and R_{10} are hydrogen or C_1–C_5 alkyl; n is an integer of 2 to 8; m is an integer of 1 to 4; and m' is an integer of 1 to 5, or the acid addition salts thereof, with the proviso that when Y and Y' are hydrogen and n is 2, R cannot be dimethylamino; when Y and Y' are hydrogen and n is 4, R cannot be dimethylamino or diethylamino and when Y' is hydrogen, Y is clorine and n is 3, R cannot be dimethylamino.

2. A method of inhibiting platelet aggregation in blood of warm blooded animals, which comprises: administering to said animal an effective amount of a compound of claim **1**.

4,323,569
β-LACTAM ANTI-BACTERIAL, COMPOSITIONS CONTAINING THEM AND A PROCESS FOR THEIR PREPARATION

Andrew J. G. Baxter, Hull, England, assignor to Beecham Group Limited, England

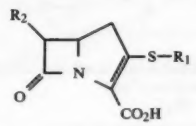
Filed Aug. 23, 1979, Ser. No. 68,893

Claims priority, application United Kingdom, Aug. 25, 1978, 34643/78

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/505*

U.S. Cl. 424—251 **86 Claims**

1. A compound of the formula (II):



(II)

a salt thereof or an ester thereof which is convertible to a corresponding salt by chemical or biological means wherein R_1 is pyrimidyl unsubstituted or substituted by one or two lower alkyl groups, or by one lower alkoxy or lower alkanoyloxy group; and R_2 is hydrogen or a group $CR_3R_4R_5$ wherein R_3 is hydrogen or hydroxy; R_4 is hydrogen or lower alkyl, and R_5 is hydrogen, lower alkyl, benzyl or phenyl or is joined to R_4 to form part of a carbocyclic ring of 5 to 7 carbon atoms.

24. A compound according to claim **1** in the form of a sodium salt.

4,323,570
SUBSTITUTED AMINOPYRIMIDINES

Wolfgang Stenzel; Wolfgang Fleck; Erich Cohnen, and Ben Armah, all of Hamburg, Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Fed. Rep. of Germany

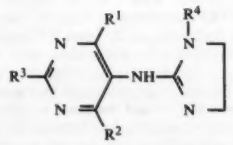
Filed Nov. 7, 1979, Ser. No. 92,134

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849537; Sep. 13, 1979, 2937023

Int. Cl.[3] **C07D** *239/20*

U.S. Cl. 424—251 **9 Claims**

1. Substituted 5-(2-imidazolin-2-yl)-amino-pyrimidines of the general formula (I)



(I)

wherein R^1, R^2, and R^3 individually denote hydrogen or halogen, or alkoxy-, alkylthio- or alkyl group, each having 1 to 4

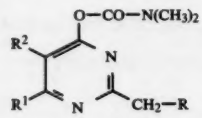
carbon atoms, or a cycloalkyl group with 3 to 5 carbon atoms, and R^4 represents hydrogen, formyl, acetyl, proprionyl, or butyryl,
provided that R^1, R^2, R^3, and R^4 are not all hydrogen at the same time, and their physiologically compatible acid addition salts.

4,323,571
COMBATING PESTS WITH 2-SUBSTITUTED-ALKYL-5-SUBSTITUTED-N,N-DIMETHYLCARBAMIC ACID O-PYRIMIDIN-6-YL ESTERS

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,540
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928185
Int. Cl.³ C07D *239/24*
U.S. Cl. 424—251 **10 Claims**

1. A 2-substituted-alkyl-5-substituted-N,N-dimethyl-carbamic acid O-pyrimidin-6-yl ester of the formula



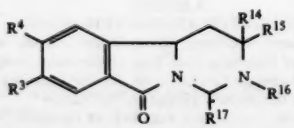
in which
R and R^2 each independently is alkoxy, alkylthio, alkylsulphinyl or alkylsulphonyl and
R^1 is hydrogen or alkyl.

4,323,572
ANTIHYPERTENSIVE TRICYCLIC ISOINDOLE DERIVATIVES

Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux, and Jean-Marie Ferland, St. Laurent, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 78,547, Sep. 24, 1979, Pat. No. 4,273,773. This application Feb. 6, 1981, Ser. No. 232,267
Int. Cl.³ A61K *31/505*; C07D *487/04*
U.S. Cl. 424—251 **12 Claims**

1. A compound of formula Ib



(Ib)

in which R^3 and R^4 each is hydrogen, lower alkoxy, lower alkyl, trifluoromethyl, halo, or hydroxy; or R^3 and R^4 together form a OCH_2O chain; R^{14} and R^{15} each is hydrogen or lower alkyl; R^{16} is hydrogen, a radical of formula $(CH_2)_nNR^{12}R^{13}$ wherein n is an integer from two to six, and R^{12} and R^{13} each is hydrogen or lower alkyl, or a radical of formula $CO(CH_2)_{n-1}NR^{12}R^{13}$ wherein n, R^{12} and R^{13} are as described herein, and R^{17} is hydrogen, or R^{16} and R^{17} together form an imine; or a thereapeutically acceptable acid addition salt thereof.

8. A method of treating hypertension in a mammal, which comprises administering to said mammal an effective antihypertensive amount of a compound of formula Ib or a therapeutically acceptable acid addition salt thereof, as claimed in claim 1.

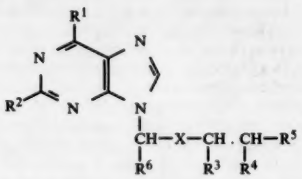
9. An antihypertensive pharmaceutical composition, which comprises an effective amount of a compound of formula Ib or a therapeutically acceptable acid addition salt thereof, as claimed in claim 1, and a pharmaceutically acceptable carrier therefor.

4,323,573
ADENINE DERIVATIVES

Howard J. Schaeffer, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 718,105, Aug. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 662,900, Mar. 1, 1976, Pat. No. 4,199,574, and Ser. No. 608,263, Aug. 27, 1975, abandoned. This application Feb. 1, 1978, Ser. No. 874,130
Claims priority, application United Kingdom, Sep. 2, 1974, 38278/74
Int. Cl.³ A61K *31/52*
U.S. Cl. 424—253 **25 Claims**

1. A compound of the formula (I)



(I)

wherein
R^1 is amino, R^2 is amino
X is oxygen or sulphur
R^3 is hydrogen, straight or branched chain or cyclic alkyl, hydroxyalkyl, benzyloxyalkyl or phenyl;
R^4 is hydrogen, hydroxy or alkyl;
R^5 is hydroxy, amino, alkyl, hydroxyalkyl, benzyloxy, benzoyloxymethyl, sulphamoyloxy, phosphate, or acyloxy having 1 to 8 carbon atoms, R^6 is hydrogen or alkyl; or a pharmaceutically acceptable salt thereof.

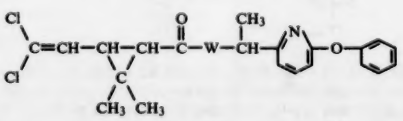
2. A pharmaceutical composition for use as an antiviral which comprises an effective antiviral amount of the compound or salt of claim 1.

4,323,574
CIS AND TRANS ISOMERS OF α-METHYL(6-PHENOXY-2-PYRIDYL)METHYL-3-(2,2-DICHLOROETHENYL)-2,2-DIMETHYLCYCLOPROPANECARBOXYLATES AND DERIVATIVES THEREOF

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Nov. 24, 1980, Ser. No. 209,912
Int. Cl.³ A01N *43/40*; C07D *213/64*
U.S. Cl. 424—263 **4 Claims**

1. A compound of the following formula (A):



(A)

wherein, W is oxygen or sulfur.

4. A method for controlling insect or acarid pests which comprises applying to the pest or its habitat a pesticidally effective amount of a compound of claim 1.

4,323,575

1-PHENYL-2-AMINOETHANOL DERIVATIVES

Geraint Jones, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

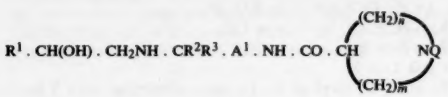
Filed May 6, 1980, Ser. No. 147,074

Claims priority, application United Kingdom, May 21, 1979, 17645/79

Int. Cl.³ C07D *205/04, 207/16, 211/60, 211/62;* A61K *31/395, 31/40, 31/445*

U.S. Cl. 424—267 9 Claims

1. A 1-phenyl-2-aminoethanol derivative of the formula:



I

wherein R^1 is selected from the group consisting of 3,4-bis[-(3–8C)alkanoyloxy]phenyl, 3,5-bis[(3–8C)alkanoyloxy]phenyl, 3-[(3–8C)alkanoyloxy]methyl-4-[(3–8C)alkanoyloxy]phenyl, 4-[(3–8C)alkanoyloxy]phenyl, 2-chlorophenyl and 3,5-dichloro-4-aminophenyl radicals; R^2 and R^3 are independently hydrogen or (1–4C)alkyl radicals; A^1 is a (1–4C)alkylene diradical; and Q is selected from the group consisting of (3–12-C)alkanoyl, [(3–6C)alkoxy]carbonyl, phenylacetyl, phenoxyacetyl, benzoyl and benzyloxycarbonyl radicals, the phenyl rings of which may optionally bear a substituent selected from the group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl radicals [n is zero, 1 or 2; and m is 2,3,4 or 5,] and wherein the diradical of the formula:

III

is an azetidin-1,2-diyl, pyrrolidin-1,2-diyl, pyrrolidin-1,3-diyl, piperidin-1,2-diyl, piperidin-1,3-diyl or piperidin-1,4-diyl radical; or a pharmaceutically acceptable acid-addition salt thereof.

7. A method for treating an area of inflammation affecting the skin of a warm-blooded animal which comprises topically administering to said area an effective anti-inflammatory amount of a compound of formula I, or a pharmaceutically acceptable acid-additon salt thereof, as claimed in claim 1.

4,323,576

DERIVATIVES OF PYRAZOLE FOR USE IN THERAPY

Kunio Seki, and Masahiko Ohki, both of Shiga, Japan, assignors to Morishita Pharmaceutical Co., Ltd., Osaka, Japan

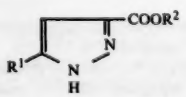
Filed Nov. 12, 1980, Ser. No. 205,936

Claims priority, application Japan, Nov. 16, 1979, 54-149103

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 P 8 Claims

1. An antihyperlipemic composition in dosage form, which comprises an antihyperlipemically effective amount of a compound of the formula:



wherein R^1 represents an alkyl group of 7–11 carbon atoms and R^2 represents H or a lower alkyl group of up to two carbon atoms, and a pharmaceutically acceptable carrier.

4,323,577

AQUEOUS SOLUTION OF NITROGLYCERIN

Takaaki Ohkuma, Tokyo; Hiroshi Ninomiya, Sayama; Masaaki Nakamura, Ageo, and Genichi Idzu, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1980, Ser. No. 203,142

Claims priority, application Japan, Nov. 13, 1979, 54-146011

Int. Cl.³ A61K *31/21*

U.S. Cl. 424—298 4 Claims

1. An aqueous solution of nitroglycerin comprising: an amount of nitroglycerin in the range 0.1 to 1.0 mg of nitroglycerin per milliliter of said solution; and an amount of a component consisting of at least one substance selected from the group consisting of sorbitol, mannitol and xylitol in the range 25 to 150 mg of said component per milliliter of said solution, said solution having a pH value of 3 to 8.

4,323,578

FLUORINATED CARBAMATE INSECTICIDES

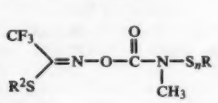
William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 65,485, Sep. 10, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 139,797

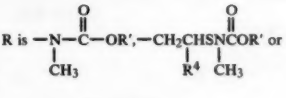
Int. Cl.³ A01N *37/52;* C07C *119/18*

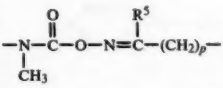
U.S. Cl. 424—298 63 Claims

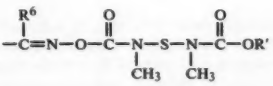
1. A compound of the formula:



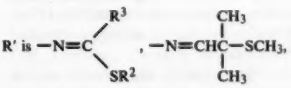
wherein



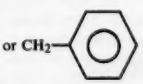




where



R^2 is C_1–C_6 alkyl; C_3–C_6 alkenyl,



;

R^3 is CFXY, $CON(CH_3)_2$, CH_2OCH_3, or C_1–C_3 alkyl wherein X and Y are independently H or F;

R^4 is H or CH_3;

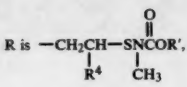
n is 1 or 2;

p is 0, 1 or 2;

R^5 or R^6 are independently H, C_1–C_4 alkyl, phenyl or phenyl substituted with one atom of F, Cl, Br or CH_3;

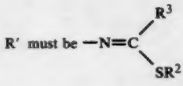
provided that when:

(1)



n must be 1;

(2) R^4 is CH_3,



and R^3 must be CFXY.

22. An agricultural composition for insecticidal use consisting essentially of a surfactant, diluent or combination thereof and an insecticidally effective amount of a compound of claim 1.

4,323,579

INSECTICIDAL N-(P-AMINOPHENYL)-N'-BENZOYLUREAS

Josef Ehrenfreund, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

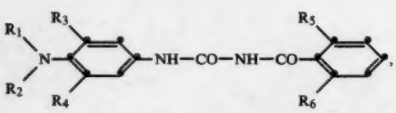
Continuation of Ser. No. 128,610, Mar. 10, 1980, abandoned. This application Jan. 14, 1981, Ser. No. 224,983

Claims priority, application Switzerland, Mar. 13, 1979, 2379/79; Feb. 12, 1980, 1134/80

Int. Cl.³ A01N *47/34*; C07C *127/22*

U.S. Cl. 424—322 11 Claims

1. A compound of the formula



(I)

wherein each of R_1 and R_2 independently is C_1–C_4 alkyl or C_3–C_5 alkenyl, each of R_3 and R_4 independently is chlorine or bromine, and each of R_5 and R_6 independently is hydrogen, fluorine or chlorine, with the proviso that R_5 and R_6 are not both simultaneously hydrogen.

9. A pesticidal composition for controlling insects and acarids which contains, as active component a pesticidally effective amount of a compound according to claim 1, together with carriers and/or other adjuvants.

10. A method for controlling insects and acarids which comprises applying thereto an insecticidally or carricidally effective amount of a compound according to claim 1.

4,323,580

MITICIDAL, FUNGICIDAL AND OVICIDAL DIPHENYLSULFENAMIDES

Gary D. Grantham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

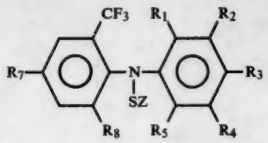
Filed Jan. 24, 1980, Ser. No. 115,105

The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.

Int. Cl.³ A01N *33/02, 37/18*; C07C *145/02*

U.S. Cl. 424—324 12 Claims

1. A compound of the formula



I

wherein

R_1, R_3 and R_4 independently are H, F, Cl, Br, NO_2, CF_3, OCF_3, OCF_2CF_2H or $S(O)_kR_6$;

R_2 is H, F, Cl, Br, NO_2 or CF_3;

R_5 is H or F;

k is 0, 1, or 2;

R_6 is C_1–C_2 alkyl or C_1–C_2 alkyl substituted with 2 to 4 atoms of Cl, F or combinations thereof;

R_7 is NO_2 or CF_3;

R_8 is NO_2 or CF_3;

Z is CCl_3, CCl_2F, CCl_2CCl_2H or CCl_2CFCL_2;

provided that when R_1 is NO_2 or CF_3, then R_3 must be H or F;

provided that at least two of the substituents R_1, R_2, R_3, and R_4 are H, F or combinations thereof;

provided that when two of the substituents R_1, R_2, R_3 and R_4 are NO_2, $S(O)_kR_6$ or combinations thereof, they are not ortho to each other;

provided that R_7 and R_8 cannot both be NO_2 unless one of R_1, R_3, or R_4 is $S(O)_kR_6$; and

provided that R_7 and R_8 cannot both be CF_3.

9. A method for control of mites, fungus disease of a plant or insect eggs which comprises applying to a locus to be protected a miticidally, fungicidally or ovicidally effective amount of a compound of claim 1.

4,323,581

METHOD OF TREATING CARCINOGENESIS

Robert J. Gander, Whitehouse, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jul. 31, 1978, Ser. No. 929,094

Int. Cl.³ A61K *31/165*

U.S. Cl. 424—324 10 Claims

1. A method of treating carcinogenesis in epithelial tissue in a mammal in need of said treatment, which comprises periodically administering to the subject mammal an effective amount for treating carcinogenesis of N-(4-hydroxyphenyl)-all-trans-retinamide.

4,323,582

METHOD OF TREATING ANIMALS AND HUMANS FOR INTERNAL AND EXTERNAL PARASITES

Norman H. Siegel, 3956 Farragut St., Hollywood, Fla. 33021, and Dan C. Roehm, 808 NE. 20th Ave., Fort Lauderdale, Fla. 33304

Filed Jul. 21, 1980, Ser. No. 170,621

Int. Cl.³ A01N *33/02*

U.S. Cl. 424—325 11 Claims

1. A method of treating animals suffering from bloodsucking parasitic infestation comprising:

administering orally or by injection to said animals a non-toxic parasitic repugnant effective amount of a lower alkanolamine selected from the group consisting of monoethanolamine, diethanolamine triethanolamine and an at least partially neutralized form thereof having a pH of between 4 and 8.

4,323,583
COLORANTS FOR LIPID-BASED EDIBLE COMPOSITIONS AND LIPID-BASED COMPOSITIONS MADE THEREFROM

Kenneth B. Basa, Evanston, and Robert G. Agusto, Chicago, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Division of Ser. No. 967,972, Dec. 11, 1978. This application Nov. 20, 1980, Ser. No. 208,552

Int. Cl.[3] **A23L** *1/275*

U.S. Cl. 426—250 **7 Claims**

1. A dry, edible, non-toxic food color blend pigment composition for imparting a brown coloration to lipid-based food products which comprises a pulverulent admixture of a water soluble, lipid insoluble caramel powder and, as a color enhancer, a pulverulent FD&C Yellow No. 6 lake.

4,323,584
METHOD OF PREPARING ANIMAL FEEDS

Karel F. Saldien, Fort Wayne, Ind., assignor to Central Soya Company, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 90,285, Nov. 1, 1979, abandoned. This application May 21, 1980, Ser. No. 152,040

Claims priority, application Netherlands, Mar. 26, 1980, 8001790

Int. Cl.[3] **A23K** *1/18*

U.S. Cl. 426—285 **2 Claims**

1. A method of preparing animal feeds consisting essentially of providing a multiple ingredient mixture having a particle size less than about 0.80 mm. and continuously introducing a dry stream of said mixture having a predetermined moisture content into a disk pelletizer inclined at an angle from about 40° to about 60° relative to the horizontal and rotating said pelletizer at a speed effective to produce agglomerated balls while simultaneously introducing separately a stream of water into said disk pelletizer with both streams being at room temperature and atmospheric pressure, and continuously removing balls and drying said balls to provide a product having a bulk density ratio of ball to said ingredient mixture of from about 0.60 to about 0.95 on the same moisture content basis, said mixture including milk particles present at least in an amount of about 30% of said mixture and having a particle size less than about 0.2 mm., and the ball diameter being about 3 mm. whereby a milk replacer is achieved which is reconstitutable with water to milk consistency in about one minute without substantial agitation.

4,323,585
PROCESS FOR THE PRODUCTION OF PASTA PRODUCTS PACKED READY FOR SALE IN SERVING PORTIONS IN PACKAGES

Josef Manser, Uzwil, Switzerland, assignor to Gebrueder Buehler A.G., Uzwil, Switzerland

Filed Feb. 14, 1980, Ser. No. 121,520

Claims priority, application Switzerland, Feb. 15, 1979, 1499/79

Int. Cl.[3] **A23L** *1/16;* **F26B** *3/04, 11/18;* **B65B** *23/00*

U.S. Cl. 426—394 **8 Claims**

1. A process for automatically producing pasta products packaged for sale in individual serving portions, comprising the steps of:

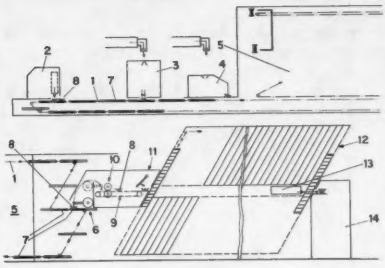
positioning groups of interconnected first package portions for movement along a feed path, each first package portion being of porous material to allow circulating air to flow therethrough;

depositing individual servings of predetermined pasta products directly onto the groups of first package portions, each first package portion including predetermined recesses thereon for receiving individual servings of the pasta products;

advancing the groups of first package portions and servings of pasta products thereon into a dryer;

circulating dry air through and around the first package portions substantially to dry the servings of pasta products thereon while in the dryer;

removing the first package portions and dried servings of pasta products thereon from the dryer;



separating the groups of first package portions into individual first package portions each having a plurality of individual servings of dried pasta products thereon; and

combining the separated first package portions with second package portions to complete packaging of the individual servings of pasta products.

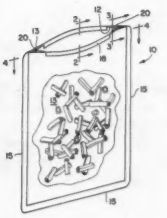
4,323,586
THERMALLY-PROCESSABLE FLEXIBLE PACKAGE AND PROCESS FOR USING SAME

Florren E. Long, Mount Vernon, Ohio, assignor to Ludlow Corporation, Needham Heights, Mass.

Filed Oct. 20, 1980, Ser. No. 198,369

Int. Cl.[3] **B65B** *31/02, 55/06;* **B65D** *33/02*

U.S. Cl. 426—412 **4 Claims**



1. In a pouch for use in the packaging and subsequent secure transporting of food, the improvement wherein said pouch is formed of two flexible sealable wall panels, said panels each being formed of an inner sheet and an adjacent outer sheet and said panels and the sheets from which they are formed being sealed together about the lateral and bottom edges of said panels and said panels being unsealed to each other across their upper edges to form an open topped pouch; said inner sheet and adjacent outer sheet of each panel being unsealed to each other between the lateral and bottom edges to define an unsealed space; the upper edge of each said wall panel comprising a major central portion therealong, which comprises a sealed edge shield, formed of the upper edge of said inner sheet and said outer sheet of each said panel being sealed together, said shield forming means to prevent contamination of said space between said inner sheets and said adjacent outer sheets during pouch-filling; and unsealed conduit means to vent said space between each of said inner sheets and each adjacent outer sheet, said conduit means being formed at the sides of each panel and between the ends of each said shield means and a sealed lateral edge adjacent to said shield means.

4. In a process for packaging food in a flexible sealable

pouch and including the step of thermally-treating such food, the improvement wherein

(1) said food is placed into the open-topped pouch of claim 1,

(2) filling said pouch while shielding said unsealed space between said sheets from contamination with food by said sealed edge shield, then

(3) subjecting said pouch to a sub-atmospheric pressure, removing any excessive insulating gas from between said sheets through said unsealed conduit means,

(4) and then sealing the upper edges of said pouch leaving said inner sheet and adjacent outer sheet of each panel in non-laminated relationship and thermally processing the sealed pouch.

4,323,587
COLORANTS FOR LIPID-BASED EDIBLE COMPOSITIONS AND LIPID-BASED COMPOSITIONS MADE THEREFROM

Kenneth B. Basa, Evanston, and Robert G. Agusto, Chicago, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Division of Ser. No. 967,972, Dec. 11, 1978. This application Nov. 20, 1980, Ser. No. 208,553

Int. Cl.³ A23L *1/275*

U.S. Cl. 426—540 **5 Claims**

1. A brown-hued cocoa replacer composition comprising a dry, pulverulent, brown-hued color blend composition containing from about 50 to 99.4% by weight spray dried powdered caramel; 0.5 to 40% by weight of FD&C Yellow No. 6 lake; 0.1 to 10% by weight of FD&C Blue No. 2 lake; a flavorant; and a diluent.

4,323,588
AERATED CONFECTIONS

Walter Vink, Purdys Station; Leonard Spooner, Port Chester, and Donald A. M. Mackay, Pleasantville, all of N.Y., assignors to Life Savers, Inc., New York, N.Y.

Filed Aug. 7, 1980, Ser. No. 175,985

Int. Cl.³ A23G *3/00*

U.S. Cl. 426—564 **17 Claims**

1. An aerated confection having good stability consisting essentially of from about 20 to about 90% by weight of a hydrogenated sugar which is isomaltitol or a mixture of isomaltitol and α-D-glucopyranosyl-1,6-mannitol, from about 5 to about 60% by weight of a hydrogenated starch hydrolysate and from about 0.5 to about 5% by weight of a whipping agent.

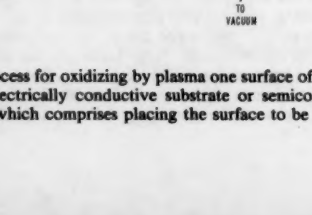
4,323,589
PLASMA OXIDATION

Asit K. Ray, Mt. Kisco, and Arnold Reisman, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 7, 1980, Ser. No. 147,684

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **14 Claims**



1. A process for oxidizing by plasma one surface of a metallic-type electrically conductive substrate or semiconductive substrate which comprises placing the surface to be oxidized perpendicular to the flow of plasma gas and in a region having a pressure of about 10 mtorr to about 100 **mtorr where the surface of the substrate which is not to be oxidized faces the plasma, and thereby oxidizing the surface of the substrate not facing the plasma.**

4,323,590
METHOD FOR IMPROVING SWITCH CONTACTS, IN PARTICULAR FOR VACUUM SWITCHES

Joseph H. Lipperts, Hengelo, Netherlands, assignor to Hazemeijer B. V., Hengelo, Netherlands

Filed Jul. 21, 1980, Ser. No. 170,925

Claims priority, application Netherlands, Jul. 24, 1979, 7905720

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **5 Claims**

1. A method for forming vacuum switch contacts, comprising:

implanting ions of a material, or a combination of materials, taken from the group consisting of Cr, Ti, Be, Si, Ni, or Ta, into the discharge area of switch contacts to a depth of 0.1 to 1.0 microns; and

continuing said ion implantation until the concentration of said ion material amounts to at least 10% by weight of the switch contact.

4,323,591
IRRADIATION OF POLYACRYLATE FILMS IN AIR

Larry A. Wendling, and John B. Covington, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 51,888, Jun. 25, 1979, Pat. No. 4,306,954. This application Jan. 29, 1981, Ser. No. 229,328

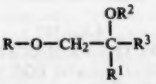
Int. Cl.³ B05D *3/06*

U.S. Cl. 427—53.1 **7 Claims**

1. The process of curing a composition to a non-tacky state said composition comprising at least 15% by weight of radiation polymerizable components having the formula

$$A^1—Z—A^2 \quad (1)$$

wherein A^1 and A^2 independently are ethylenically unsaturated terminal groups having terminal ethylenic unsaturation and having the formula

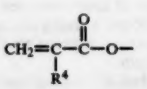


wherein R—O— is a monovalent residue of an aliphatic terminally unsaturated primary alcohol, ROH, formed oy the removal of the active hydrogen from the primary —OH group, R having the formula:

$$[E—(CH_2)_b]_m R^5—(CH_2)_c$$

wherein

E is



c is an integer of from 1 to 6,

b is zero or an integer of from 1 to 6,

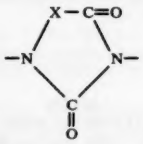
R^1 and R^4 independently represent hydrogen or methyl,

R^5 is an aliphatic group having from 1 to 15 carbon atoms, and no more than two catenary oxygen or carboxy groups, a valence of m+1,

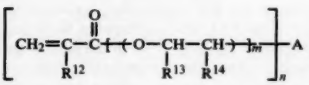
m is an integer of from 1 to 5,
R^2 represents hydrogen or groups of the formula or

or

wherein
R^6 represents alkyl or alkenyl groups,
R^7 is an aliphatic or aromatic group of up to eight carbon atoms,
R^3 is an alkylene group of from 1 to 6 carbon atoms with up to one catenary oxygen atom, and
Z is a heterocyclic group of the formula

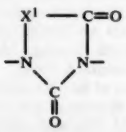


wherein
X is a divalent group which is required to complete a 5- or 6-membered heterocyclic ring, or



(2)

wherein
R^{12} and R^{13} independently represent hydrogen or methyl,
R^{14} represents hydrogen, an alkyl group, or a phenyl group,
R^{13} and R^{14} together may represent a trimethylene or tetramethylene group,
m represents a number of from 1 to 30,
n is 2 or 3, and
a represents a group of the formula



wherein
X^1 represents the divalent radical necessary to complete a 5- or 6-membered heterocyclic ring group, said process comprising exposing said composition to radiation within the ultraviolet and visible spectral region while the composition is in the presence of an atmosphere of at least 2% by volume of oxygen to polymerize said components having formula (1) or (2) wherein said composition is in the form of a film on a substrate.

4,323,592

PROCESS FOR PRODUCING A SHAPED ARTICLE HAVING A MAT SURFACE

Isao Sasaki, 2-6-206, Kurokawa 3-chome, and Kenji Kushi, 2-6-101, Kurokawa 3-chome, both of Obtake-shi, Hiroshima-ken, Japan

Filed May 15, 1980, Ser. No. 150,141
Claims priority, application Japan, Jun. 21, 1979, 54-78378
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—54.1 **2 Claims**

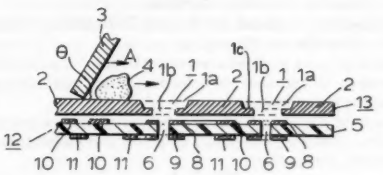
1. A process for producing a shaped article having a uniform mat surface which comprises: coating a surface of a shaped resin article with an acrylic coating composition comprising an acrylic or methacrylic ester polymer, and a polyfunctional monomer containing at least two acryloyloxy or methacryloyloxy groups per molecule; irradiating the coated surface with ultraviolet rays, and; further, coating the irradiated surface with a hardening liquid comprising mainly a polyfunctional monomer containing at least three acryloyloxy or methacryloyloxy groups per molecule, and; irradiating the further coated surface with ultraviolet rays.

4,323,593

METHOD OF PRINTING A SPOT PATTERN IN A PRINTED CIRCUIT BOARD

Eiichi Tsunashima, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 11, 1980, Ser. No. 139,213
Claims priority, application Japan, Apr. 11, 1979, 54-44710
Int. Cl.³ H05K *3/40*
U.S. Cl. 427—97 **7 Claims**



1. A method of applying a paste through a through-hole in a printed circuit board, comprising:

forming a mask having a hole therethrough having (a) an upper larger cross-section hole portion having a bottom portion and (b) a lower smaller cross-section hole portion extending downwards from said bottom portion of said upper hole portion and said bottom portion of said upper hole portion forming an inhole ring-shaped land, the lower hole portion having a cross-section larger than the cross-section of said through hole in the printed circuit board;

placing the printed circuit board close to and facing said lower hole portion of said mask with said through hole positioned substantially coaxially with said hole in said mask and with the portion of the surface of said printed circuit board which is away from said mask uncovered;

applying a paste to said hole in said mask from said upper hole portion;

pressing said paste applied to said upper hole portion through said lower hole portion of said mask and through said through-hole in said printed circuit board for filling said through-hole with said paste and coating the surface of the printed circuit board which is toward said mask and/or the surface of said printed circuit board which is away from said mask in the area around and close to said through-hole with said paste; and hardening said paste.

4,323,594

COLLOIDAL DISPERSIONS FOR ACTIVATING NON-CONDUCTORS PRIOR TO ELECTROLESS PLATING

Nathan Feldstein, 63 Hemlock Cir., Princeton, NJ 08540

Continuation-in-part of Ser. No. 672,044, Mar. 30, 1970, which is a division of Ser. No. 607,506, Aug. 26, 1975, Pat. No. 3,993,799, which is a continuation-in-part of Ser. No. 512,224, Oct. 4, 1974, abandoned. This application May 27, 1980, Ser. No. 153,272

Int. Cl.[3] C23C *3/02*

U.S. Cl. 427—98 5 Claims

1. A process for the electroless plating of a non-conductor substrate comprising

contacting said substrate prior to plating with a colloidal composition comprising a copper colloid admixed with cuprous compound and wherein the admixing takes place subsequent to the production of the copper colloid.

4,323,595

NICKEL-MOLYBDENUM CATHODE

Cletus N. Welch, Clinton, and John O. Snodgrass, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 6,068, Jan. 24, 1979, Pat. No. 4,248,679. This application Jan. 31, 1980, Ser. No. 117,414

The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.

Int. Cl.[3] B05D *1/08, 5/12*

U.S. Cl. 427—123 5 Claims

1. A method of preparing an electrode having a porous surface on a metal substrate comprising:

(a) depositing an aqueous alkali metal hydroxide impermeable nickel film on the substrate;

(b) flame spraying particles comprising an alloy of nickel and aluminum and separate particles comprising molybdenum onto the nickel film; and

(c) leaching out said aluminum whereby to form a porous surface consisting essentially of nickel and molybdenum atop the porous film.

4,323,596

COATING IRON OXIDE PARTICLES FOR MAGNETIC RECORDING

Gunter Buxbaum, Krefeld; Ingo Pflugmacher, Meerbusch; Franz Hund, Krefeld; Volker Hahnkamm, Krefeld, and Peter Woditsch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,870

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 2815712

Int. Cl.[3] B22F *1/02;* G11B *5/62;* C01G *49/02*

U.S. Cl. 427—127 5 Claims

1. In the preparation of highly orientatable needle-shaped ferrimagnetic iron oxide particles by the reduction and reoxidation of needle-shaped particles of hydrated oxide of iron which have been surface treated before reduction against sintering the improvement which comprises effecting the surface treatment by applying to the particles of hydrated oxide of iron one layer of oxygen-containing anions selected from the group consisting of silicate, phosphate, borate, vanadate, molybdate and tungstate and a further layer of polyvalent cations selected from the group consisting of aluminum, chromium, manganese, iron and gallium, each layer weighing about 0.02 to 2% by weight of the particle.

4,323,597

PROCESS FOR PRODUCING AN ULTRAVIOLET RADIATION STABILIZED POLYMERIC ARTICLE

Daniel R. Olson, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Sep. 15, 1980, Ser. No. 187,508

Int. Cl.[3] B05D *7/02, 3/02, 7/24*

U.S. Cl. 427—160 8 Claims

1. A process for producing a polycarbonate resin article having an improved resistance to degradation by ultraviolet radiation comprising impregnating the surface layers of said article with at least one ultraviolet radiation absorber by contacting the surface of said article with an ultraviolet radiation stabilizing composition consisting essentially of (i) at least one ultraviolet radiation absorbing compound, and (ii) at least one liquid carrier which is nonaggressive towards and wets polycarbonate selected from the class consisting of alcohols, hydroxy ethers, alcohol-water mixtures, liquid aliphatic hydrocarbons, liquid cycloaliphatic hydrocarbons, and chlorofluorocarbons, and thereafter heating said article containing said stabilizing composition on its surface for a period of time at a temperature sufficient for said ultraviolet radiation absorbing compound to effectively impregnate the surface layers of said article but insufficient to deleteriously affect the physical properties of said polycarbonate.

4,323,598

METHOD OF COATING GLASS SURFACE WITH HEAT-REFLECTING METAL OXIDE FILM

Seiki Okino; Toshiharu Yanai, and Katsuto Tanaka, all of Matsusaka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 15, 1980, Ser. No. 216,752

Claims priority, application Japan, Dec. 28, 1979, 54-170462

Int. Cl.[3] C03C *17/25;* G02B *1/10*

U.S. Cl. 427—160 6 Claims

1. In a method of coating a glass plate surface with a heat-reflecting metal oxide film, which comprises titanium oxide as a principal component thereof, through the step of spraying a solution containing a thermally decomposable organic titanium compound dissolved in an organic solvent onto a surface of a glass plate which has been heated such that said surface is maintained at a temperature sufficient to cause thermal decomposition of said organic titanium compound to titanium oxide, the improvement comprising the spraying step being performed by maintaining the absolute humidity of the spraying atmosphere, in which said glass plate is disposed, below about 0.008 kg H_2O/kg dry gas.

4,323,599

METHOD FOR ACHIEVING PARTICLE-TO-PARTICLE CONTACT IN AN ANTIFOULING COATING

David W. Marshall, North Reading, Mass., assignor to Kennecott Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 46,904, Jun. 8, 1979, abandoned, which is a division of Ser. No. 886,951, Mar. 15, 1978, Pat. No. 4,197,233. This application Nov. 28, 1979, Ser. No. 98,312

Int. Cl.[3] B05D *7/22*

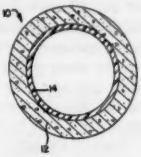
U.S. Cl. 427—181 9 Claims

1. A method for controlling fouling of the surface of a water pipe interior or a submergible or submerged marine structure by applying a copper-containing polymeric coating, said method comprising:

(a) providing the copper in flake form;

(b) cleaning the copper flake to remove substantially all contaminating surface deposits;

(c) mixing the cleaned copper flake with an uncured water-insoluble polymer;



(d) applying the mixture as a coating onto the surface of the water pipe interior or submergible or submerged marine structure; and
(e) curing the coating.

4,323,600

PROCESS FOR METALLIC COAT FINISHING

Kenji Sakata, Kamakura; Toshiaki Yamada, Yokohama; Kenji Uchiyama, Odawara, and Yugo Hasegawa, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 176,155
Claims priority, application Japan, Aug. 7, 1979, 54-99907
Int. Cl.³ B05D *1/36*
U.S. Cl. 427—202 **9 Claims**

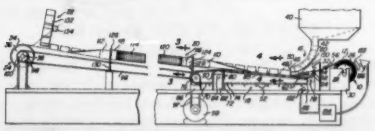
1. A process for metallic coat finishing which comprises
(1) undercoating a substrate with a liquid coating (A) comprising a thermosetting vinyl copolymer (a) of 5,000–30,000 in number average molecular weight and a pigment (b) imparting a metallic appearance to the coating to form a first coated film,
(2) without baking the first coated film obtained as in step (1), overcoating said coated film obtained as in step (1) with a clear thermosetting powder paint (B) to form a second coated film and thereafter,
(3) baking the two coated films together, said thermosetting vinyl copolymer (a) being obtained by copolymerizing 3–25% by weight of N-alkoxymethyl(metha)acrylic amide, 3–20% by weight of a hydroxyl group containing vinyl monomer, 0.5–5% by weight of a carboxyl group containing vinyl monomer and 50–93.5% by weight of copolymerizable other vinyl monomers.

4,323,601

METHOD FOR PRINTING CANS FROM HEAT TRANSFER PAPER

Danny L. McMillin, Golden, and James S. Stirbis, Littleton, both of Colo., assignors to Coors Container Company, Golden, Colo.

Continuation of Ser. No. 943,372, Sep. 18, 1978, Pat. No. 4,250,831. This application Jun. 16, 1980, Ser. No. 159,876
Int. Cl.³ B05D *5/00*
U.S. Cl. 427—287 **12 Claims**



1. A method of continuous transfer of images onto outer surfaces of generally cylindrical members by use of a sheet material having a series of spaced heat transferable ink images thereon comprising the steps of:
continuously unwinding a roll of sheet material and rewinding sheet material at a distance from said unwinding to provide a moving unwound intermediate length of material;
feeding in spaced sequence the generally cylindrical members into association with said unwound intermediate length of material;
transporting said generally cylindrical members in a predetermined position relative to said spaced ink images on the moving intermediate length of material;
wrapping the unwound intermediate length of material about the outer surfaces of the generally cylindrical members associated therewith to form wrapped cylindrical members;
heating said wrapped cylindrical members to cause the transfer of said images to the outer surfaces of the generally cylindrical members;
unwrapping the unwound intermediate length of material from said wrapped cylindrical members after said heating; and
removing cylindrical members from said intermediate length of material.

4,323,602

WATER REPELLENT AND PRESERVATIVE FOR WOOD PRODUCTS

Thomas G. Parker, Three Rivers, Mich., assignor to Roberts Consolidated Industries, Inc., City of Industries, Calif.

Filed May 14, 1980, Ser. No. 149,155
Int. Cl.³ B05D *1/18, 1/28, 3/00*
U.S. Cl. 427—298 **7 Claims**

2. The method of protecting wood and wood based products by impregnating with an aqueous solution containing 3-iodo-2-propynyl butyl carbamate and paraffin wax emulsion.

4,323,603

FLUOROELASTOMER FILM COMPOSITIONS CONTAINING SILANE COMPOUNDS AND METHOD FOR THE PREPARATION THEREOF

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Filed Aug. 18, 1980, Ser. No. 178,788
Int. Cl.³ B05D *3/02*
U.S. Cl. 524—545 **15 Claims**

2. A method for adhering fluoroelastomer film compositions, devoid of metallic oxides, to substrates comprising the steps of:
dissolving a fluoroelastomer gum selected from the group consisting of copolymers of vinylidene fluoride and hexafluoropropylene, and terpolymers of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene in a solvent; and
adding a silane compound to said gum solution said silane compound having the formula $RCH_2CH_2CH_2SiR'_{3-n}(OR'')_n$, where R is an organofunctional group selected from the group consisting of amine and epoxy molecules; R′ is a simple alkyl group having about one to five carbon atoms; OR″ is a hydrolyzable alkoxy group, R″ being an alkyl group having about one to four carbon atoms and n is 1, 2 or 3;
coating said substrate with said fluoroelastomer gum-silane solution; and
evaporating said solvent and leaving a film firmly adhered to said substrate.

4,323,604

CONTINUOUS DIP-PLATING PROCESS ON ONE-SIDE OF STEEL STRIP

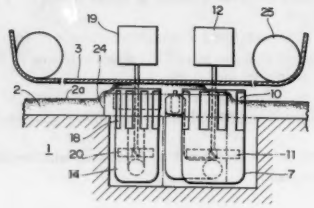
Shuzo Fukuda, and Yutaka Ohkubo, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,630

Claims priority, application Japan, Jun. 1, 1979, 54-67445; Dec. 6, 1979, 54-158635

Int. Cl.³ C23C *1/02, 7/00*

U.S. Cl. 427—433 3 Claims



1. A continuous dip-plating process for plating one side of a steel strip, wherein said strip travels substantially horizontally over a still surface of a plating bath, while said plating bath is spouted onto said one side of said strip, and wherein a plating flow is provided along the edges of said strip in a widthwise direction outwardly from said edges, and a plating flow is provided along the central part of said strip in a lengthwise direction.

4,323,605

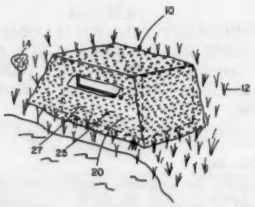
CAMOUFLAGE INCISING GEOMETRY

Charles R. Rush, DeLand, Fla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 928,880, Jul. 28, 1978, abandoned, which is a continuation of Ser. No. 723,331, Sep. 14, 1976, abandoned. This application Jan. 21, 1980, Ser. No. 113,468

Int. Cl.³ F41H *3/02*

U.S. Cl. 428—17 6 Claims



1. A camouflage material for covering and stretching over a structure to prevent visual and radar detection thereof, said camouflage material being formed of a planar sheet of material having top and bottom surfaces, a vertical dimension and a horizontal dimension substantially perpendicular to said vertical dimension, and a plurality of spaced apart horizontally aligned rows and vertically aligned columns of V-shaped cuts therethrough, each V-shaped cut comprising two straight unequal in length cuts defining a triangular member hinged about a base angularly disposed with respect to the horizontal dimension of the sheet and having a central axis bisecting the angle formed between the legs which axis is substantially aligned in the vertical dimension of said sheet, alternate rows of V-shaped cuts being inverted with respect to intermediate rows of V-shaped cuts with the inverted V-shaped cuts being further aligned in alternate vertical columns intermediate vertical columns containing the upright V-shaped cuts, the longer length cut of each triangular member having an end adjacent to the end of the shorter length of cut of the adjacent triangular member, the vertical component of the longer length of cut being from 12% to 25% greater than the vertical component of the shorter length of cut of each V-shaped cut whereby stretching said material in a direction transverse to the rows of V-shaped cuts extends the apexes of the triangular members in one row upward out of the plane of the sheet away from said top surface with the next adjacent row of cuts extending the apexes of the triangular members downward out of said plane away from said bottom surface, said V-shaped cuts projecting from said surfaces substantially straight relative to the plane of said sheet to prevent viewing of both of said surfaces simultaneously from one side of said sheet.

4,323,606

CONJUGATED DIENE/MONOVINYL AROMATIC COPOLYMER-BASED HEAT CONTRACTIBLE FILM COATINGS ON GLASS BOTTLE

Ollie G. Buck, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 917,440, Jun. 20, 1978, abandoned. This application Dec. 27, 1979, Ser. No. 107,793

Int. Cl.³ B05D *3/06*

U.S. Cl. 428—35 4 Claims

1. A coated object said object having been coated by a coating contracting operation in which a coating applied comprises essentially a blend of a conjugated diene/monovinyl aromatic copolymer having the ratio of conjugated diene to vinyl aromatic of from about 20/80 to about 50/50 Copolymer I and a conjugated diene/monovinyl aromatic copolymer having a conjugated diene/monovinyl aromatic ratio ranging from about 50/50 to about 90/10 Copolymer II each said copolymer having at least about 5 wt. % olefinic unsaturation said Copolymer I being represented by the formula $(AB)_nZ$ or AB and said Copolymer II being represented by formula AB wherein A is a polyvinyl aromatic segment, B is a polyconjugated diene, Z is a polyfunctional coupling residue or polyfunctional initiator residue and n is an integer in the range 2 to 4, wherein Copolyer I is present in the approximate range of 90–50 and Copolymer II is present in the approximate range of 10–50, by weights percent.

4,323,607

HEAT SHRINKABLE COVERS

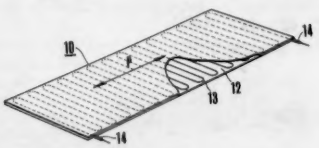
Hiroshi Nishimura; Tetsuo Monma; Minoru Yoshida, all of Yokohama; Kazunari Kirimoto, Chiba; Yoshio Hayamizu, Goi, and Toshio Nagasawa, Kyoto, all of Japan, assignors to UBE Industries, Ltd. and The Furukawa Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 23, 1979, Ser. No. 68,761

Claims priority, application Japan, Sep. 1, 1978, 53-106199; Sep. 1, 1978, 53-106200

Int. Cl.³ H05B *3/10*

U.S. Cl. 219—213 14 Claims



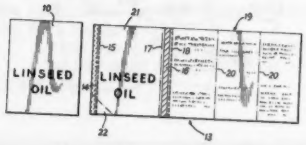
1. A heat shrinkable synthetic resin cover comprising a heat shrinkable synthetic resin member having a heat shrinkability in substantially one direction, and a flexible electric heating member made of a metallic elongated resistive conductor coated with a cross-linked polymer having a gel fraction of from 20 to 60% and embedded in said heat shrinkable synthetic resin member having a heat shrinkability in substantially one

direction, said heating member being arranged with said metallic elongated conductor in a zig-zag form transverse to said direction of heat shrink of said heat shrinkable synthetic resin member and operable to contract upon heat shrinkage of said synthetic resin member in said direction induced by heat produced by electric current flowing through said metallic elongated resistive conductor.

4,323,608
LABEL

Russell W. Denny, 35 Horringer Rd., and Barry D. Denny, 11 Gage Close, both of Bury St. Edmunds, Suffolk, England

Filed Jun. 30, 1980, Ser. No. 164,019
Int. Cl.³ A44C *3/00*; G09F *3/00*; B65D *65/28*
U.S. Cl. 428—43 **9 Claims**



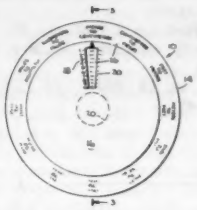
1. A label comprising a first portion in the form of a sheet having a forward non-adhesive face and a rear face which has an adhesive applied thereto, and a second portion formed separately from said first portion and secured thereto by two spaced bands of adhesive, said second portion comprising a strip having one end edge portion secured to said forward face of said first portion by one of said bands of adhesive, a front part extending across said forward face of said first portion from said one band of adhesive, a transverse tear line adjacent and parallel to said one band of adhesive whereby said front part can be detached from said one end edge portion, a fold line at the edge of said front part remote from said tear line, a back part joined to said front part along said fold line and constituting a substantial proportion of the length of said second portion, which back part is disposed between said front part and said first portion, the second of said bands of adhesive securing said back part to said first portion adjacent said fold line and extending parallel to said fold line, a second transverse tear line formed in said back part adjacent and parallel to said second band of adhesive at the side of said second band of adhesive remote from said fold line, whereby tearing of said second portion along the first said transverse tear line enables said back part to be torn along said second tear line.

4,323,609
ROTATABLE WHEEL ASSEMBLY

Howard M. Bromberg, Bronx, N.Y., assignor to The Flexi-Group Inc., New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,272
Int. Cl.³ G09F *11/04*
U.S. Cl. 428—65 **25 Claims**

1. A rotatable wheel assembly comprising a pair of generally flat oppositely disposed parallel cover members, a generally flat wheel member sandwiched between said oppositely disposed cover members, said wheel member having an axis of rotation substantially perpendicular to the oppositely disposed cover members and including an axial opening encompassing said axis of rotation, the axial opening of said wheel member not encompassing any pivot disc that is contiguous with said wheel member, and grommetless securing means on at least one of said cover members for securing said one cover member to said other cover member through said axial opening in said wheel member such that the securance of said cover members

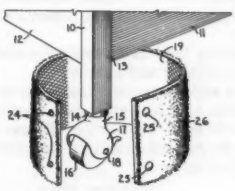


through said axial opening forms a pivot for rotation of said wheel member substantially about said axis with respect to said cover members.

4,323,610
FOOT PROTECTOR FOR FURNITURE

George C. Leverich, 4905 N. Topping, Kansas City, Mo. 64119

Filed Apr. 14, 1980, Ser. No. 140,149
Int. Cl.³ B32B *1/08, 3/02*
U.S. Cl. 428—68 **14 Claims**



1. A protective sleeve for enclosing the foot of a normally vertical material object support leg, as well as a portion of the leg above said foot, comprising:

an elongate, substantially rectangular strip of material having relatively longer, substantially parallel and normally substantially horizontal upper and lower edges and relatively shorter, substantially parallel and normally substantially vertical end edges and inner and outer faces,

means on said strip adjacent the end edges thereof for releasably engaging the said end edges together to form a continuous, cylindrical sleeve, with the strip outer face on the outside thereof,

said strip of sufficient strength, dimensional stability and height to stand on one lower edge thereof on a normally horizontal supporting surface, when the end edges thereof are engaged together, said strip encircling and enclosing the said support leg foot and a portion of said leg thereabove,

said strip additionally sufficiently resilient in the body thereof to form a cushion to shock on impact of a contacting object (such as a person's bare foot) striking the enclosed support leg and foot through the strip,

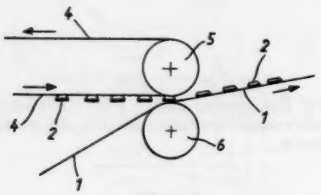
said strip further additionally of greater interior dimension then said support leg and any enclosed parts thereof, including its foot, whereby, when the strip is applied around (encircling and partially enclosing) the support leg foot and some of said leg and the end edges thereof engaged together, it normally stands substantially free of said foot and leg, supporting itself and giving an initial foot warning contact to an unexpecting contacting object, independent of the structure of the support leg foot and support leg thereof, before there is any contact by said object with the surrounded leg or foot.

4,323,611

DECORATIVE MATERIAL AND A PROCESS FOR PRODUCING THE SAME

Martin Pöll, Fritzens, Austria, assignor to D. Swarovski & Co., Osterreich, Austria

Filed Jan. 9, 1980, Ser. No. 110,613
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901728
Int. Cl.³ B44C *1/26, 1/28, 3/12*
U.S. Cl. 428—67 4 Claims



1. A decorative composite material for application to a substrate such as textile, comprising:

a thin, open mesh, net-like backing layer, for example tulle;

decorative elements larger than the mesh size of the backing layer each secured to said backing layer by a respective individual heat activatable adhesive layer, said adhesive layer penetrating at least partially through said backing layer;

said backing layer being thermally stable at the activating temperature of said adhesive;

whereby said composite material can be applied to a desired substrate by reactivating each thermally heat activatable adhesive layer to cause the adhesive to completely penetrate the mesh-like backing layer and to contact an underlying substrate.

4,323,612

CARPETS HAVING PILE OF CRIMPED AND NON-CRIMPED NYLON FILAMENTS

Ernst J. van Issum, Echternach, Luxembourg, assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 37,605, May 10, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 142,208
Int. Cl.³ D03D *27/00*
U.S. Cl. 428—89 5 Claims

1. A cut pile tufted carpet wherein each tuft consists of two continuous filament nylon yarns plied together, in which one of the yarns is composed of crimped filaments and the other yarn is composed of non-crimped filaments wherein all of the filaments are of substantially the same dTex and the ratio of crimped filaments to non-crimped filaments is 3:1 to 1:3.

4,323,613

LAMINATE MATERIAL

Dennis Snyder, Rt. 1, Atwood Elems, Mineral City, Ohio 44656

Filed Jan. 14, 1980, Ser. No. 112,089
Int. Cl.³ B32B *27/12, 27/20*
U.S. Cl. 428—111 13 Claims

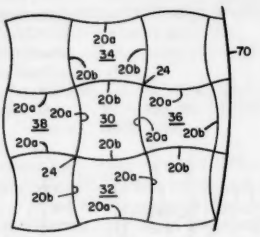
1. A substantially light-impervious laminate material comprising the combination of a first light-reflective polyvinyl chloride sheet, an open scrim sheet, a second light-reflective polyvinyl chloride sheet, and a light-absorptive pigmentary bonding agent permeating the scrim sheet and binding together the first sheet, the second sheet and the scrim sheet.

4,323,614

CERAMIC HONEYCOMB STRUCTURE

Suresh T. Gulati, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,155
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—116 3 Claims



1. In a ceramic honeycomb structure including a plurality of interrelated cells of identical shapes formed by interconnected partitions extending through the structure parallel to a honeycomb axis to form in cross-sectional planes normal to the honeycomb axis a reoccurring pattern of cells, a cell construction which is relatively uniform in structural elasticity in said cross-sectional planes and which deforms in a preinduced manner under stresses exerted in the cross-sectional planes, said cell construction comprising: a plurality of curved partitions having a sinusoidal shape along their extent, said curved partitions being interconnected at junctures to form a plurality of adjacent cells; each said cell having a longitudinal axis extending through the center thereof; said partitions being alternately convexly and concavely curved about the longitudinal axis of the cell; each of said convex and concave partitions having the shape of a half sine wave; each said half sine wave having amplitude means for minimizing the structural elastic modulus anisotropy in directions lying in said cross-sectional planes and for minimizing the bending stresses at end portions of said interconnected partitions adjacent said junctures; said curved partitions having a selected thickness; and said amplitude means including an amplitude of said half sine wave which is less than said selected thickness.

4,323,615

LAMINATED ARTICLE

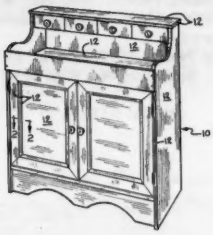
Myrl D. Sauder, Archbold, Ohio, assignor to Sauder Woodworking Company, Archbold, Ohio

Division of Ser. No. 780,765, Mar. 24, 1977, Pat. No. 4,089,721. This application Mar. 17, 1978, Ser. No. 887,497
Int. Cl.³ B32B *3/04;* B29C *17/04*
U.S. Cl. 428—121 7 Claims

1. A laminated product comprising a substrate having sharp corners or bends of contour, comprising:

contiguous sheet laminate bonded on said substrate surfaces shaped around said sharp corners or bends of contour, said

laminate including inner lamina overlying said substrate surfaces of a thermo-forming organic plastic material and



an outer surface lamina intimately bonded to said inner lamina of a thermo-setting organic plastic material.

4,323,616

REINFORCED VENEER SHEET AND THE METHOD OF MANUFACTURING THE REINFORCED VENEER SHEET

Yasuhiro Ibuki, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Filed Feb. 6, 1980, Ser. No. 118,905
Int. Cl.[3] B32B *3/10;* B27C *1/00, 9/00*
U.S. Cl. 428—134 5 Claims

1. A reinforced veneer sheet having at least one row of closed cuts, said closed cuts in each row having spaces therebetween, said closed cuts extending completely through said veneer sheet and across its grain; and a length of cord extending on one side of said veneer sheet and having intermediate portions forced through said spacially arranged closed cuts to protrude in part from the other side of said veneer sheet, said intermediate portions being clasped only by said spacially arranged closed cuts extending across said grain.

4,323,617

SEMICONDUCTOR CERAMIC COMPOSITION FOR BOUNDARY LAYER CAPACITORS

Harufumi Mandai, and Kunitaro Nishimura, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 942,690, Sep. 15, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,666
Claims priority, application Japan, Sep. 16, 1977, 52/111807; Sep. 16, 1977, 52/111808
Int. Cl.[3] B32B *5/04, 15/16;* C04B *35/46*
U.S. Cl. 428—148 4 Claims

1. A semiconductor ceramic boundary layer capacitor comprising a shaped ceramic semiconductor having insulating grain boundary layers on crystal grains of said shaped semiconductor formed by firing a shaped semiconductor ceramic composition in a neutral or reducing atmosphere and then heat treating said shaped semiconductor ceramic composition in an oxidizing atmosphere to form said insulating grain boundary layers wherein said semiconductor ceramic composition consists essentially of 99.90 to 99.995 weight % of a semiconductor ceramic component and 0.005 to 0.1 weight % of phosphorus, said semiconductor ceramic component consisting essentially of a solid solution of strontium titanate or modified strontium titanate having a composition expressed by the general formula:

$$(Sr_{1-x}A_x)(Ti_{1-y}Zr_y)O_3$$

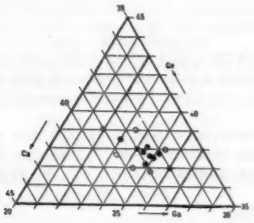
wherein A is Ba or Ca, and x and y are mole fractions of the respective components and take respective values in the following ranges, $O \leqq x \leqq 0.20$, $O \leqq y \leqq 0.20$, and at least one semiconductorizing agent selected from the group consisting of Sb, Ta, Nb, W, Y, La and rare earth elements, said semiconductorizing agent being present in an amount sufficient to semiconductorize the solid solution but not more than 5 weight %, and wherein said insulating grain boundary layers formed as a result of the heat treating of said shaped semiconductor ceramic composition are formed from at least one member selected from the group consisting of V, Cr, Mn, Fe, Co, Ni, As, Sb, Tl, Bi and their oxides, said boundary layer capacitor having a permittivity of from 32,000 to 63,000 and a dielectric loss of from 0.36 to 0.70%.

4,323,618

SINGLE CRYSTAL OF CALCIUM-GALLIUM GERMANIUM GARNET AND SUBSTRATE MANUFACTURED FROM SUCH A SINGLE CRYSTAL AND HAVING AN EPITAXIALLY GROWN BUBBLE DOMAIN FILM

Johannes P. M. Damen, and Johannes A. Pistorius, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 740,245, Nov. 8, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,165
Claims priority, application Netherlands, Jun. 16, 1976, 7606482
Int. Cl.[3] B32B *7/02*
U.S. Cl. 428—212 7 Claims



1. A single crystal of a non-magnetic synthetic garnet material, characterized in that the garnet material is calcium-gallium-germanium garnet.

2. A bubble domain device comprising a bubble domain film grown epitaxially on a crystallographic face of a monocrystalline garnet substrate, the substrate material consisting of calcium-gallium-germanium garnet having a melting point of about 1380° C.

4,323,619

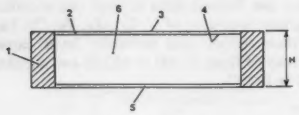
COVERING ELEMENT SCREENING OFF THE SOLAR RADIATION FOR THE APPLICATIONS IN THE REFRIGERATION BY RADIATION

Vittorio Silvestrini, Naples; Mario Peraldo, Milan, and Enrico Monza, Nerviano (Milan), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 869,279, Jan. 13, 1978, abandoned. This application Jul. 23, 1979, Ser. No. 59,598
Claims priority, application Italy, Jan. 17, 1977, 19361 A/77
Int. Cl.[3] B32B *7/00, 5/16, 27/08;* F25B *27/00*
U.S. Cl. 428—212 7 Claims

7. A flexible covering element having selective optical properties, being useful as a protective screen for refrigerating devices which provide refrigeration by selective irradiation, said covering element consisting of a film which is transparent to infrared radiations in a range of light wavelengths com-

prised between 8 and 13 μm, consisting of two films coupled to each other and each formed of a polymer selected from the group consisting of polyethylene and ethylene copolymers, one of said films being white and containing at least one white pigment of granule size lower than 8 μm and selected from the group consisting of TiO_2, CaO, ZnS and MgO in a weight ratio comprised between 2% and 20% for films having a thickness of about 25 to 100 μm, and the other of said films being black and containing at least one coloring adjuvant which is a dye or



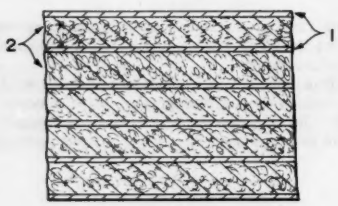
pigment of granule size lower than 3 μm and selected from the group consisting of cobalt oxide and carbon black, the cobalt oxide, if present, being present in a weight ratio of between 1% and 5% for films having a thickness of about 25 to 100 μm, and the carbon black, if present, being in a weight proportion of between 0.1% and 0.5% for films having a thickness of about 25–100 μm, the concentration of total additives in the films depending on the thickness of the film and the granule size of the pigments and dyes used, and selected to result in the desired optical properties.

4,323,620

MULTILAYER HEAT INSULATOR

Suminobu Iwabuchi, and Kazumasa Matsui, both of Takatsuki, Japan, assignors to Yuasa Battery Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 51,455, Jun. 22, 1979, abandoned. This application Feb. 15, 1980, Ser. No. 121,908
Claims priority, application Japan, Jun. 30, 1978, 53/80812
Int. Cl.³ B32B *7/02, 15/14*
U.S. Cl. 428—215 **4 Claims**



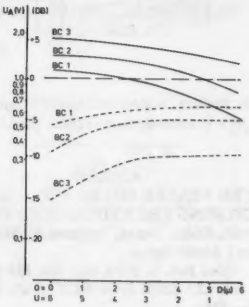
1. A multilayer heat insulator, comprising: gas-impermeable layers each made of a metal foil of one member selected from the group consisting of aluminum, nickel and stainless steel; gas-containing layers each made of at least one member selected from the group consisting of glass fiber, ceramic fiber, carbon fiber, silica powder, alumina powder and zirconia powder in the form of wool, paper or mat; said gas-impermeable and gas-containing layers being laminated alternately so that the same layers are in non-contacting relationship with each other; the thickness of each gas-impermeable layer is 10 to 20 μm; the thickness of each gas-containing layer is 0.3 to 1.8 mm and has a porosity of 0.98 to 0.95 and a bulk density of 0.04 to 0.1 gm/cm³ and weight per unit area of 0.02 to 0.05 g/cm² to make the thermal conductivity of this laminated multilayer heat insulator about 0.02 kcal/mh° C. (200° C.).

4,323,621

MAGNETIC RECORDING MEDIUM

Heinrich Kober, Hohenschaeftlarn; Burkhard Nippe, Munich, and Bernhard Seidel, Pullach all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 12, 1979, Ser. No. 2,955
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801452
Int. Cl.³ G11B *5/70*
U.S. Cl. 428—216 **5 Claims**



1. In a magnetic tape recording material for tape recorders operable with the iron oxide bias and a playback equalization of 120 μs having improved stability, a support and, arranged one above the other thereon, at least two layers containing magnetic pigments and synthetic resin binders and differing in coercivity and layer thickness, characterised in that the uppermost layer contains as acicular, magnetic pigment magnetite thermally stabilized with one or more elements comprised of an effective amount of P (expressed as P_2O_5) or B (expressed as B_2O_3) together with a metal selected from the group consisting of Cd, Pb, Ca, Mg, Zn, Al, Cr, W, said stabilizing element or elements being present in an amount of from 0.1 to 5% by weight based on Fe_3O_4, and having an average crystallite size, as determined by X-ray photography, of from 30 to 35 nm and a coercivity of from 28 to 36 KA/m, said magnetite having a bias noise level, based on the reference level, which is lower by about 3 dB in relation to the standardized low-noise standard.

4,323,622

HIGH-ELASTICITY PRESS FELT

Arne I. L. Gladh, Skoghall, and Eric W. Gröndahl, Halmstad, both of Sweden, assignors to Albany International Corp., Albany, N.Y.

PCT No. PCT/SE78/00080, § 371 Date Jul. 21, 1979, § 102(e) Date Jul. 17, 1979, PCT Pub. No. WO79/00312, PCT Pub. Date Jun. 14, 1979
PCT Filed Nov. 21, 1978, Ser. No. 61,293
Claims priority, application Sweden, Nov. 21, 1977, 7713097
Int. Cl.³ B32B *5/06*
U.S. Cl. 428—230 **11 Claims**

1. A dewatering felt of needled textile fibre material for use in the press section of paper-making machines, cellulose machines and similar machines, characterised in that said material comprises high-molecular thermoplastic elastomer fibres which may be stretched to at least twice their original length and thereafter, after relief of the load thereon, rapidly return to essentially their original length.

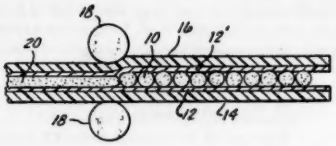
4,323,623
COMPOSITE PLASTIC STRUCTURE AND METHOD FOR PRODUCING SAME

Robert O. Ahrens, and Jerry L. Merkel, both of Florissant, Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 833,029, Sep. 14, 1977, abandoned. This application Oct. 27, 1978, Ser. No. 955,472

Int. Cl.[3] **B32B** *5/16, 27/04, 27/12, 27/20*

U.S. Cl. 428—246 **19 Claims**



1. A composite plastic structure consisting of a core material of a thermosetting resin containing a major volume of glass microballoons, and adjacent outer layers of a fibrous material impregnated with a thermosetting resin, wherein said resin of said core material and of said outer layers is a thermosetting resin selected from the group consisting of epoxy, polyimide, polyester, polyurethane and phenolic resins, said fibrous material being selected from the group consisting of graphite, glass, boron, polyamide, polyimide and poly (paraphenyl terephthalamide) fibers and woven fibers.

4,323,624
METHOD OF PREPARING WRINKLE-RESISTANT FABRIC

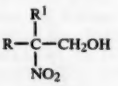
Jerry H. Hunsucker, and Milton E. Woods, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 170,437, Jul. 21, 1980, which is a continuation-in-part of Ser. No. 63,221, Aug. 3, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 210,988

Int. Cl.[3] **B06D** *13/34;* **B05D** *3/02;* **B32B** *7/00, 27/42*

U.S. Cl. 428—270 **32 Claims**

1. A method of preparing a wrinkle-resistant fabric by the steps of (a) impregnating the fabric with a curable urea-formaldehyde resin and a catalyst therefor and from 0.25 to 3.0 moles of a nitroalkanol per mole of urea, said nitroalkanol being represented by the formula



where R and R^1 are hydrogen, methyl, ethyl or hydroxymethyl and can be the same or different and (b) heating to 225° F. to 350° F. to effect a cure of the resin.

4. A wrinkle-resistant fabric obtained by the method of claim 1.

5. A woven fabric of claim 4 made of wool or cotton.

4,323,625
COMPOSITES OF GRAFTED OLEFIN POLYMERS AND CELLULOSE FIBERS

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 13, 1980, Ser. No. 159,078

Int. Cl.[3] **B32B** *23/00;* **C08L** *61/10*

U.S. Cl. 428—361 **26 Claims**

1. A composite consisting essentially of from 2 to 55 weight percent of discontinuous cellulose fibers, the remaining from 98 to 45 weight percent being a matrix comprising from 2 to 99.9 parts by weight of a crystalline polymer from alpha olefin monomer having 2 to 4 carbon atoms, said polymer having methylol phenolic groups grafted thereto, and at least 0.1 part by weight of a bonding agent per 100 parts of matrix by weight.

19. Treated fibers comprising discontinuous cellulose fibers of aspect ratio greater than five and crystalline polymer from alpha olefin monomer having 2 to 4 carbon atoms, said polymer having methylol phenolic groups grafted thereto, and said polymer being present in an amount sufficient to reduce fiber-to-fiber affinity up to about 85 parts by weight per 100 parts of fibers by weight.

4,323,626
HEAT-ADHESIVE COMPOSITE FIBERS

Kohichi Kunimune, Moriyamashi; Teruaki Hane, Shigaken; Seigo Inadomi, Monyamashi, and Yasuhiko Furukawa, Kusatsushi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 62,814, Aug. 1, 1979, Pat. No. 4,234,655, which is a continuation-in-part of Ser. No. 31,989, Apr. 20, 1979, abandoned, which is a continuation of Ser. No. 842,660, Oct. 11, 1977, abandoned. This application Sep. 18, 1980, Ser. No. 188,302

Claims priority, application Japan, Oct. 20, 1976, 51/125723; Dec. 13, 1976, 51/149597; Apr. 12, 1977, 52/41685

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.[3] **D02G** *3/00*

U.S. Cl. 428—374 **7 Claims**

1. Heat-adhesive composite fibers having a denier within the range of 1–20, and comprising

(a) a first component of crystalline polypropylene, and P1

(b) a second component consisting of a polymer mixture composed of (1) a saponification product of an ethylene-vinyl acetate copolymer and (2) polyethylene,

said saponification product of an ethylene-vinyl acetate copolymer containing 0.5–18 mol % of vinyl monomer units consisting of vinyl alcohol units and vinyl acetate units based upon the total of vinyl alcohol units, vinyl acetate units and ethylene units, and having a saponification degree of 30% or more,

said polymer mixture consisting of more than 70% by weight of said saponification product of an ethylene-vinyl acetate copolymer and less than 30% by weight of said polyethylene,

said polymer mixture containing 0.5–18 mol % of vinyl monomer units consisting of vinyl alcohol units and/or vinyl acetate units based upon the total of vinyl acetate units, vinyl alcohol units and the total of ethylene units in said saponification product and those in said polyethylene, in the said polymer mixture,

the composite ratio of said first component to said second component being in the range of 40:60 to 70:30,

said first and second components being joined together along an axially extending interface, and

said second component forming at least 50% of the exterior surface of the composite fibers continuously in the longitudinal direction of the fibers so as to give the composite fibers heat-adhesive properties.

4,323,627

HOLLOW FIBER AND METHOD OF MANUFACTURING THE SAME

Yasushi Joh, Yokohama, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 916,950, Jun. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 754,973, Dec. 28, 1976, abandoned. This application Dec. 8, 1980, Ser. No. 213,877

Claims priority, application Japan, Dec. 29, 1975, 50-156316; Jul. 8, 1976, 51-81570

Int. Cl.³ D02G 3/00

U.S. Cl. 428—398 12 Claims

1. A method of manufacturing a hollow fiber which comprises:

providing a spinning solution of a water miscible organic solvent having a dipole moment less than 3.6×10^{-18} esu and a high molecular weight compound selected from the group consisting of polyacrylonitrile, a copolymer of acrylonitrile, a cellulose ester, polymethylmethacrylate, and poly-γ-benzyl glutamate, extruding said spinning solution through an annular slit,

simultaneously extruding an alkaline or acid aqueous salt solution from an orifice encircled by said annular slit, said aqueous salt solution having a a salt content of 15 to 50% by weight, being a non-coagulant for said spinning solution, being immiscible with said spinning solution and being capable of developing a phase separation with said solvent by a salting out effect, there being sufficient alkali or acid present in said aqueous salt solution to effect hydrolysis of said high molecular weight compound, and

introducing the extruded spinning solution with said aqueous salt solution contained therein into a coagulating bath to initiate coagulation.

4,323,628

MAGNETIC RECORDING MEDIUM

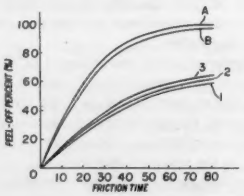
Kiyotaka Okuyama, and Akihiko Hosaka, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,533

Claims priority, application Japan, Aug. 17, 1979, 54/104606

Int. Cl.³ B32B 27/30

U.S. Cl. 428—425.9 3 Claims



1. A magnetic recording medium which comprises a substrate coated with a magnetic composition comprising a magnetic powder in a binder comprising a vinyl chloride-vinyl acetate vinyl alcohol copolymer having more than 10 wt. % of vinyl alcohol component and polyvinyl chloride impregnated nitrocellulose which is crosslinked with a polyisocyanate.

4,323,629

METALLIC THIN FILM MAGNETIC RECORDING MEDIUM

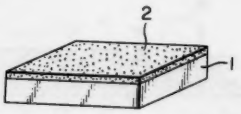
Toshiaki Kunieda, Minoo; Masaru Odagiri; Takashi Fujita, both of Kawanishi, and Koichi Shinohara, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 11, 1980, Ser. No. 167,418

Claims priority, application Japan, Jul. 17, 1979, 54-91318

Int. Cl.³ G11B 5/62

U.S. Cl. 428—457 3 Claims



1. A metallic thin film recording medium comprising a magnetic thin film deposited from the vapor phase in an oxygen atmosphere on a non-magnetic substrate, said thin film consisting essentially of nickel, cobalt and oxygen;

the content of nickel being between 10 and 55 percent by weight based on the weight of nickel and cobalt; and

the ratio of the oxygen atoms to the sum of the nickel and cobalt atoms in atomic percent being between 3 and 45 percent.

4,323,630

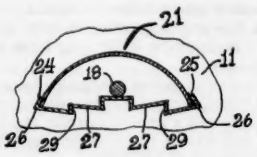
TROPHY SUPPORT COLUMN

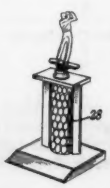
William H. Mackey, 1825 S. Busse Rd., Mount Prospect, Ill. 60058, and Lee R. Smith, 200 Mingo Trail, Longwood, Fla. 32750

Filed Sep. 2, 1980, Ser. No. 183,190

Int. Cl.³ B32B 9/04

U.S. Cl. 428—542 1 Claim





1. A trophy structure having a base and a support plate with a figure mounted thereon comprising:

(a) a hollow weight supporting column extending in a vertical relation between the base and the figure supporting plate,

(b) said column having a rectangularly shaped metallic front plate adapted to be of a length to extend between the base and the supporting plate,

(c) a non-metallic back panel having a width greater than that of said front plate and of a length to extend between the base and the supporting plate,

(d) flanges extending rearwardly and in converging direc-

tion from the opposite side longitudinal edges of said front plate, providing spaced apart retaining members for mounting therebetween said back panel in a rearwardly tensioned bowed condition onto the back of said front panel,

(e) said front plate providing in its face a series of spaced apart recessed shoulders for receiving and retaining a decorative front insert panel in a forwardly tensioned bowed condition with respect to the face of said front plate, and

(f) a removable decorative front insert panel having a width less than that of said front plate yet greater than the width between said spaced apart shoulders so as to be mounted thereon between longitudinal edges of said front plate.

4,323,631

SOLDER REMOVING DEVICE

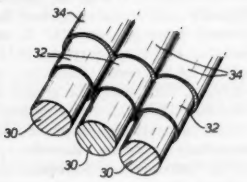
Ernst Spirig, CH-8640 Rapperswil, Switzerland

Filed Oct. 27, 1980, Ser. No. 201,228

Claims priority, application United Kingdom, Sep. 5, 1980, 28819/80

Int. Cl.³ B23P *17/06*

U.S. Cl. 428—605 **12 Claims**



1. A solder removing device, comprising

(a) a group of fibers (30) formed from a temperature-resistant non-metallic material;

(b) at least one layer of metal (32) metallizing said fibers; and

(c) a layer of solder flux (34) coating the metallized fibers, thereby to render the fibers more capable of wetting with molten solder, whereby the interstices between the fibers serve to absorb molten solder by capillary attraction.

4,323,632

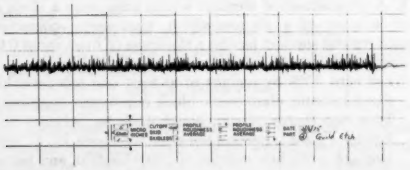
METAL COMPOSITES AND LAMINATES FORMED THEREFROM

Betty L. Berdan, Willowick, and William M. King, Mentor, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 952,512, Oct. 17, 1978, Pat. No. 4,234,395, which is a continuation of Ser. No. 652,139, Jan. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 431,060, Jan. 7, 1974, abandoned. This application Aug. 15, 1980, Ser. No. 178,451

Int. Cl.³ B32B *15/08, 15/20*

U.S. Cl. 428—626 **6 Claims**



1. A metal composite comprising:

(a) a substrate having a mildly, uniformly etched aluminum alloy surface, said alloy consisting of at least about 99 wt.% aluminum, up to about 1.00 wt.% silicon plus iron, from about 0.05 to about 0.20 wt.% copper, up to about 0.05 wt.% manganese and up to about 0.10 wt.% zinc,

(b) an electrocathodically deposited foil of copper having a thickness within the range of about 0.1 to about 0.4 mils uniformly adhering directly to said surface, and

(c) a coating on said copper foil of a material selected from the group consisting of zinc and indium, said coating having a thickness within the range of about 10 to about 25 microinches such that when the coated face of said copper foil is bonded by heat and pressure to a resinous substrate the peel strength between said copper foil and said aluminum alloy surface is a value within the range of from about 0.3 to about 2 lbs./in.

4,323,633

UV-ABSORBING COMPOUNDS AND PHOTOGRAPHIC ELEMENTS CONTAINING THEM

Paolo Beretta, Ferrania, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 13, 1980, Ser. No. 206,377

Claims priority, application Italy, Nov. 9, 1979, 65207 A/79

Int. Cl.³ G03C *1/84*

U.S. Cl. 430—17 **14 Claims**

1. A photographic element comprising a support, at least one silver halide photographic emulsion layer and at least one auxiliary layer, said photographic element being characterized by having in at least one of said silver halide emulsion layer and said auxiliary layer an ultraviolet radiation absorbing 2-(2'-hydroxyphenyl)-benzotriazole compound having two butyl groups attached to the 2'-hydroxyphenyl nucleus and a third butyl group attached to the benzotriazole nucleus.

4,323,634

ELECTROGRAPHIC TONER AND DEVELOPER COMPOSITION CONTAINING QUATERNARY AMMONIUM SALT CHARGE CONTROL AGENT

Thomas A. Jadwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 690,331, May 26, 1976, abandoned, and a continuation-in-part of Ser. No. 594,395, Jul. 9, 1975, abandoned. This application Nov. 10, 1977, Ser. No. 850,164

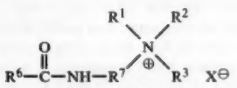
Int. Cl.³ G03G *9/08*

U.S. Cl. 430—110 **10 Claims**

1. A dry, particulate, electrostatic toner composition having a particle size from about 0.1 to about 100 microns and comprising

(a) a polymeric binder having a softening temperature from about 40° C. to about 200° C. and

(b) from about 0.01 to about 2 percent by weight of a quaternary ammonium salt surfactant of the formula:



wherein:

R^1, R^2, and R^3 are the same or different lower alkyl groups;

R^6 is an alkyl group having 7 or more carbon atoms;

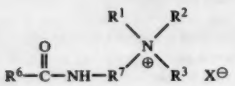
R^7 is a straight chain alkylene group having from 1 to about 8 carbon atoms; and

$X^\ominus$ is a halide ion or an organosulfur-containing anion of the formula R^5SO_n wherein R^5 is an aliphatic or aromatic group having up to about 10 carbon atoms and n is 3 or 4,

the amount of said quaternary ammonium salt being effective to provide an electrostatic toner that is capable of maintaining a relatively high, stable net toner charge level under widely varying relative humidity conditions.

6. A dry, particulate electrostatic toner composition having a particle size from about 0.1 to about 30 microns and comprising

(a) a polymeric binder,
(b) a pigment or dyestuff in an amount sufficient to color the particles, and
(c) from about 0.01 to about 2 percent by weight of said composition of a quaternary ammonium salt of the formula:



wherein:
R^1, R^2 and R^3 are the same or different alkyl groups, each having from 1 to about 4 carbon atoms;
R^6 is an alkyl group having from about 7 to about 11 carbon atoms;
R^7 is a straight-chain alkylene group having from 1 to about 8 carbon atoms; and
$X^{\ominus}$ is a halide ion or an organosulfur-containing anion of the formula R^5SO_n wherein R^5 is an alkyl or aryl group having up to about 10 carbon atoms and n is 3 or 4.

4,323,635

DIRECT REVERSAL PHOTOGRAPHIC COLOR MATERIAL

Yasushi Oishi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 6, 1980, Ser. No. 204,667
Claims priority, application Japan, Nov. 6, 1979, 54-144155
Int. Cl.³ G03C *5/54*
U.S. Cl. 430—217 **28 Claims**

1. A color photographic material suitable for processing with an alkaline solution in the presence of a developing agent comprising a support and, in sequence, the following five layers:
(1) a first emulsion layer containing an internal latent image forming direct reversal silver halide emulsion that is selectively sensitive to light in a first spectral region;
(2) a first color material layer containing a ballasted dye releasing redox compound that provides a dye image that selectively absorbs light in the first spectral region;
(3) an intermediate layer containing a ballasted reducing agent capable of capturing an oxidized developing agent or electron transfer agent;
(4) a second emulsion layer containing an internal latent image forming direct reversal silver halide emulsion that is selectively sensitive to light in a second spectral region; and
(5) a second color material layer containing a ballasted dye releasing redox compound that provides a dye image that selectively absorbs light in the second spectral region;
wherein the improvement comprises uniformly incorporating a surface latent image forming negative silver halide emulsion that is sensitive to light in the second spectral region in the intermediate layer (3) so as to obtain uniform oxidation of reducing agent that is formed in the intermediate layer (3) as a result of development of the second emulsion layer.

4,323,636

PHOTOSENSITIVE BLOCK COPOLYMER COMPOSITION AND ELEMENTS

Gwendyline Y. Y. T. Chen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 926,578, Jul. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 130,470, Apr. 1, 1971, abandoned. This application Mar. 2, 1981, Ser. No. 239,415
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—271 **10 Claims**

1. A compatible photosensitive, elastomeric composition comprising:
(1) at least 30% by weight of at least one solvent-soluble, thermoplastic, elastomeric block copolymer containing at least two thermoplastic, nonelastomeric polymer blocks having a glass transition temperature above 25° C. and an average molecular weight of 2000–100,000, and between said thermoplastic, nonelastomeric polymer blocks an elastomeric polymer block having a glass transition temperature below 10° C. and an average molecular weight of about 25,000 to 1,000,000, the thermoplastic, nonelastomeric polymer blocks being the terminal blocks of said copolymer and being connected by said elastomeric polymer block,
(2) at least 1% by weight of at least one addition-polymerizable, ethylenically unsaturated compound having a boiling point at normal pressure over 100° C. taken from the group consisting of t-butyl acrylate, N,N-diethylaminoethyl acrylate, 1,4-butanediol diacrylate, hexamethylene glycol diacrylate, decamethylene glycol diacrylate, 2,2-dimethylolpropane diacrylate, tripropylene glycol diacrylate, 2,2-di(p-hydroxyphenyl)-propane diacrylate, 2,2-di(p-hydroxyphenyl)-propane dimethacrylate, polyoxyethyl-2,2-di(p-hydroxyphenyl)-propane dimethacrylate, butylene glycol dimethacrylate, hexamethylene glycol dimethacrylate, 2,2,4-trimethyl-1,3-pentanediol dimethacrylate, 1-phenylethylene-1,2-dimethacrylate, and triethyleneglycol diacrylate said addition-polymerizable, ethylenically unsaturated compound being compatible with the thermoplastic-elastomeric block copolymer component which is soluble in or which forms a solution with the ethylenically unsaturated compound; and
(3) a polymerization-effective amount of polymerization initiator activatable by actinic radiation.

4,323,637

USE OF COVER SHEET AND INTERPOSED FLEXIBLE FILM WITH BLOCK COPOLYMER COMPOSITION

Gwendyline Y. Y. T. Chen, Wilmington, and James F. Brennan, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 926,579, Jul. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 374,567, Jun. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 130,470, Apr. 1, 1971, abandoned. This application Jan. 5, 1981, Ser. No. 222,713
Int. Cl.³ G03C *1/68, 5/30, 1/76, 1/78*
U.S. Cl. 430—271 **8 Claims**

1. A photosensitive element which comprises a sheet support; a layer of a photosensitive, elastomeric composition coated on said support having a thickness of from about 0.0005 to about 0.250 inch, said composition comprising
(1) at least 30% by weight of at least one solvent-soluble, thermoplastic, elastomeric block copolymer containing at least two thermoplastic, nonelastomeric polymer blocks having a glass transition temperature above 25° C. and an average molecular weight of 2000–100,000, and between said thermoplastic, nonelastomeric polymer blocks an elastomeric polymer block having a glass transition temperature below 10° C. and an average molecular weight of about 25,000 to 1,000,000.
(2) at least 1% by weight of an addition-polymerizable ethyl-

enically unsaturated compound containing at least one terminal ethylenical group, and

(3) a polymerization-effective amount of polymerization initiator activatable by actinic radiation;

a flexible cover sheet; and a flexible, polymeric film interposed between said cover sheet and the surface of said layer.

4,323,638

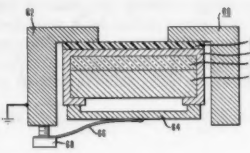
REDUCING CHARGING EFFECTS IN CHARGED-PARTICLE-BEAM LITHOGRAPHY

Arthur C. Adams, Berkeley Heights; Frank B. Alexander, Jr., Totowa; Hyman J. Levinstein, Berkeley Heights, and Louis R. Thibault, Piscataway, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 18, 1980, Ser. No. 178,988

Int. Cl.³ B05D *3/06*

U.S. Cl. 430—275 **15 Claims**



1. A method of fabricating integrated circuits by patterning a resist layer by means of a charged-particle beam in a high-resolution lithographic system, said method comprising the steps of

forming on one main surface of a wafer a layer to be patterned,

depositing a continuous charge-conducting film on top of said layer to be patterned, on the sides of said wafer and on at least a peripheral portion of the other main surface of said wafer,

depositing a resist layer on top of the portion of said charge-conducting film that overlies the main surface of said wafer,

mounting said wafer in a cassette holder to establish an electrical connection between the peripheral portion of said charge-conducting film and a part of said holder that is connected to a point of reference potential,

and, while said wafer is so mounted in said cassette holder, delineating a pattern in said resist layer by directing a charged-particle beam at said resist layer.

4,323,639

PHOTOSENSITIVE POLYAMIDE RESIN COMPOSITION

Kazumasa Chiba, Nagoya; Keiichi Egawa, Otsu, and Toshio Muraki, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP79/00307, § 371 Date Jul. 24, 1980, § 102(e) Date Jul. 24, 1980, PCT Pub. No. WO80/01212, PCT Pub. Date Jun. 12, 1980

PCT Filed Nov. 30, 1979, Ser. No. 202,381

Claims priority, application Japan, Dec. 1, 1978, 53/147833; Dec. 13, 1978, 53/153139

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—281 **5 Claims**

1. A photosensitive polyamide resin composition comprising a polyamide containing 10 to 70% by weight of a polyoxyethylene segment or poly(oxyethylene/oxypropylene) copolymer segment having a number average molecular weight of from 150 to 1,500 in its molecular chain and from 5 to 200% by weight based on the weight of the polyamide of a photopolymerizable unsaturated compound.

4,323,640

POSITIVE IMAGING METHOD USING DOPED SILVER HALIDE MEDIUM

Nicholas F. Borrelli, Elmira, N.Y., and Peter L. Young, North Wales, Pa., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 5, 1980, Ser. No. 204,165

Int. Cl.³ G03C *5/24, 1/76*

U.S. Cl. 430—353 **4 Claims**

1. A method for forming a positive image in a photosensitive medium which comprises the steps of:

(a) providing a multilayer photosensitive medium comprising alternating layers of doped silver halide and tin oxide on a substrate, the doped silver halide layers consisting essentially, in weight percent, of at least about 50% AgCl, 15–25% CuCl, 5–15% $CuCl_2$ and 10–20% AgI by weight;

(b) selectively exposing the medium to ultraviolet light for a time sufficient to achieve darkening of the exposed portions; and

(c) heating the medium at a temperature and for a time sufficient to bleach the darkened exposed portions and to darken the unexposed portions thereof.

3. A photosensitive medium for forming a positive image of a subject which comprises alternating layers of doped silver halide and tin oxide on a substrate, the doped silver halide layers consisting essentially, in weight percent, of at least about 50% AgCl, 15–25% CuCl, 5–15% $CuCl_2$ and 10–20% AgI.

4,323,641

PHOTOGRAPHIC IMAGE ENHANCEMENT BY A GOLD-TONING NEUTRON-ACTIVATION PROCESS

Clarence D. Bond, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1980, Ser. No. 178,330

Int. Cl.³ G03C *7/00*

U.S. Cl. 430—370 **3 Claims**

1. A method of photographic image enhancement on a film for subsequent transfer of the images to another film comprising the steps of:

immersing a developed photographic film containing silver grains dispersed in an emulsion including gelatin molecules in a toning solution of gold chloride and ammonium thiocyanate whereby gold simultaneously plates the silver grains and attaches to the gelatin molecules;

washing the film in a complexing solution of ammonium thiocyanate for substantially removing the gold from the gelatin molecules; and

exposing the film to neutron radiation for rendering the gold plating radioactive.

4,323,642

STABLE PHOTOGRAPHIC DEVELOPERS CONTAINING AN INDAZOLE ANTIFOGGANT AND A LIGNOSULFONATE

Steven R. Levinson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,778

Int. Cl.³ G03C *5/30*

U.S. Cl. 430—438 **16 Claims**

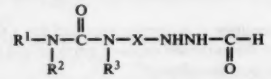
1. A photographic developing composition comprising at least one developing agent, an indazole antifoggant, and a lignosulfonate in an amount sufficient to suppress precipitation of said indazole antifoggant.

4,323,643
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Hiroyuki Mifune; Shigeo Hirano, and Yoshitaka Akimura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 6, 1980, Ser. No. 204,666
Claims priority, application Japan, Nov. 6, 1979, 54/144158
Int. Cl.[3] G03C 5/24, 1/02
U.S. Cl. 430—441 19 Claims

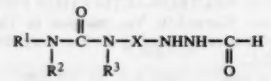
1. A silver halide photographic light-sensitive material comprising at least one silver halide photographic emulsion layer consisting essentially of surface latent image-type silver halide grains, wherein at least one layer contains a compound represented by formula (I) in an amount sufficient to improve dot quality and contrast,



(I)

wherein R^1 and R^2 each represents hydrogen, an aliphatic hydrocarbon group, an aryl group, or a heterocyclic group; R^3 represents hydrogen or an aliphatic hydrocarbon group; and X represents a divalent aryl group.

15. A process for forming a photographic image which comprises developing the silver halide photographic light-sensitive material comprising at least one silver halide photographic emulsion layer consisting essentially of surface latent image-type silver halide grains, wherein at least one layer contains a compound represented by formula (I) in an amount sufficient to improve dot quality and contrast,



(I)

wherein

R^1 and R^2 each represents hydrogen, an aliphatic hydrocarbon group, an aryl group, or a heterocyclic group;

R^3 represents hydrogen or an aliphatic hydrocarbon group; and

X represents a divalent aryl group;

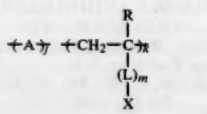
by a developer containing a dihydroxybenzene.

4,323,644
PHOTOGRAPHIC MATERIAL CONTAINING POLYMERS WITH ACTIVE ESTER GROUPS

Taku Nakamura; Masasi Ogawa, and Kunio Ishigaki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

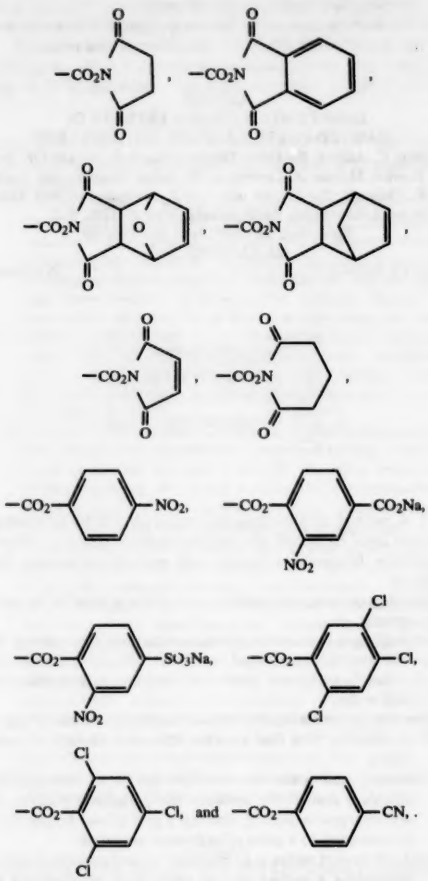
Filed Nov. 5, 1980, Ser. No. 204,669
Claims priority, application Japan, Nov. 5, 1979, 54/143036
Int. Cl.[3] G03C 1/78
U.S. Cl. 430—518 16 Claims

1. A silver halide photographic material having at least one layer containing a polymer having a repeating unit of formula (I):



(I)

wherein A is a monomer unit copolymerized with a copolymerizable ethylenically unsaturated monomer; R is a hydrogen atom or a lower alkyl group having 1 to about 6 carbon atoms; L is a bivalent linking group having 1 to about 20 carbon atoms; X is an active ester group selected from the group consisting of



j and k each represents molar percent, and j being between 0 and 95 and k being between 5 and 100; m is 0 or 1.

4,323,645
ORGANIC HALOGEN COMPOUNDS FOR NEGATIVE-WORKING SILVER HALIDE EMULSIONS

Laurence W. Hall, Asheville, N.C., and Joseph D. Overman, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1980, Ser. No. 174,551
Int. Cl.[3] G03C 1/02
U.S. Cl. 430—564 6 Claims

1. A negative-working silver halide emulsion having low fog and improved aging stability, characterized in that the preparation of said emulsion includes an after-digestion of, or in-line injection of, an organic halogen compound selected from the group consisting of 2,2,2-trichloroethanol, m-nitrobenzyl chloride, 3-chloroaniline, 2-chloro-4-nitrobenzyl chloride, o-chloranil, p-nitrobenzyl chloride, 4-chloro-2-nitrobenzyl chloride, 4-chloro-3-nitrobenzyl chloride, o-nitrobenzyl chloride, α,α,α,-trichlorotoluene, 4,6-dichloro-5-nitropyrimidine, 5-

chloro-2(trichloromethyl)benzimidazole, 2-chloro-3-nitropyridine and 2-amino-3,5-dichloropyridine.

4,323,646

PROCESS FOR HARDENING A PHOTOGRAPHIC MATERIAL

Peter Bergthaller, Cologne; Wolfgang Himmelmann, and Johannes Sobel, both of Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,242

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943807

Int. Cl.³ G03C *1/30*

U.S. Cl. 430—622 **14 Claims**

1. A process for hardening a photographic silver halide material comprising of a support layer and, applied thereto, at least one gelatin-containing layer, said process comprising hardening said at least one gelatin-containing layer with a compound containing vinyl sulfonyl groups wherein the hardener is a compound containing at least two free sulfonyl groups in a molecule of a compound containing up to six vinyl sulfonyl corresponding to the following general formula

$$(CH_2{=}CH{-}SO_2)_a{-}Z{-}(SO_2{-}CH_2{-}CH_2{-}SO_3Me)_b$$

in which

Z is an x-functional aliphatic hydrocarbon radical which may be substituted, an x-functional cycloalkane radical which may be substituted or an x-functional aromatic radical which may be substituted,

x is an integer of from 3 to 6,

a=x−b

b=1 or 2 and

Me is an alkali metal or ammonium ion.

4,323,647

STERIC HINDRANCE ENZYME IMMUNOASSAY

Nobuo Monji, Miami Springs, and Albert Castro, Miami, both of Fla., assignors to University of Miami, Coral Gables, Fla.

Filed Oct. 15, 1980, Ser. No. 197,063

Int. Cl.³ G01W *33/54*; C12W *9/96*

U.S. Cl. 435—7 **52 Claims**

1. A process for separating a dissolved unbound ligand-enzyme conjugate from the same conjugate bound to a receptor for the ligand moiety and dissolved in the same solution, comprising:

contacting (i) an aqueous solution containing both an unbound ligand-enzyme conjugate and the same conjugate bound through its ligand moiety to a receptor that binds specifically to the ligand, with (ii) an insoluble immobilized pseudo-substrate for the enzyme moiety of said conjugate, said receptor and said pseudo-substrate being so selected that

(a) the enzyme moiety of the ligand-enzyme conjugate binds to the immobilized pseudo-substrate, and

(b) the receptor, when bound to the ligand moiety of the ligand-enzyme conjugate, inhibits the binding of the enzyme moiety of the bound conjugate to the immobilized pseudo-substrate,

whereby the unbound ligand-enzyme conjugate is immobilized to the insoluble immobilized pseudo-substrate and removed from the solution while the receptor-bound conjugate remains in solution.

18. An assay procedure for detecting or determining a dissolved ligand in a medium suspected of containing it, comprising:

combining in an aqueous liquid vehicle, to form a mixture:

(1) said medium,

(2) a given amount of a soluble conjugate of an enzyme with the same ligand or its immunochemical equivalent as the ligand to be detected, and

(3) a given amount of a receptor capable of specifically binding to both the ligand to be detected and the ligand moiety of the conjugate, the relative amounts of conjugate and of receptor being such that there is an excess of the conjugate present over that necessary to bind with the receptor,

contacting said mixture with an insoluble immobilized pseudo-substrate for the enzyme moiety of said conjugate whereby said receptor bound to the ligand moiety of said conjugate inhibits said conjugate from binding to said immobilized pseudo-substrate;

separating said insoluble immobilized pseudo-substrate having bound thereto, through the enzyme moiety of the conjugate, unbound conjugate from the liquid, and

detecting the enzyme activity of either said liquid or said separated pseudo-substrate as an indicator of the presence or quantity of the ligand in said original medium.

4,323,648

PREPARATION OF MONACOLIN K

Kazuhiko Tanzawa; Seigo Iwado; Yoshio Tsujita; Masao Kuroda, and Kouhei Furuya, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Apr. 4, 1980, Ser. No. 137,821

Claims priority, application Japan, May 11, 1979, 54-57927

Int. Cl.³ C12P *17/06*

U.S. Cl. 435—125 **12 Claims**

1. A process for preparing Monacolin K comprising cultivating at least one strain of the genus Monascus, selected from the group consisting of *Monascus anka* SANK 10171 (IFO 6540), *Monascus purpureus* SANK 10271 (IFO 4513), *Monascus ruber* SANK 10671 (FERM 4958), *Monascus vitreus* SANK 10960 (FERM 4960), *Monascus paxii* SANK 11172 (IFO 8201), *Monascus ruber* SANK 13778 (FERM 4959), *Monascus ruber* SANK 15177 (FERM 4956) and *Monascus ruber* SANK 18174 (FERM 4957), in a culture medium containing an assimilable carbon source and an assimilable nitrogen source to produce Monacolin K and isolating Monacolin K from the culture medium.

4,323,649

BIOTRANSFORMATIONS USING METHANE-UTILIZING BACTERIA

Irving J. Higgins, Wingham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 28, 1980, Ser. No. 125,660

Claims priority, application United Kingdom, Mar. 9, 1979, 08357/79

Int. Cl.³ C12P *7/40*

U.S. Cl. 435—136 **4 Claims**

1. A process for the partial degradation of a complex organic compound

selected from the group consisting of mono-alkyl benzenes having from 5 to 12 carbon atoms in the alkyl group and di-substituted lower alkyl benzenes having at least one halogen substituent,

into at least one other oxidized and/or dehalogenated organic compound, said process comprising the step of contacting the complex organic compound with a methane-utilizing bacterium of a genus selected from the group consisting of Methylosinus, Methylocystis, Methylomonas, Methylococcus and Methylobacterium or with an extract thereof containing a methane mono-oxygenase and/or a de-halogenase enzyme under conditions suitable for enzymatically partially degrading the complex organic compound.

4,323,650

IMMOBILIZATION OF BIOLOGICALLY ACTIVE SUBSTANCES IN A POROUS SUPPORT

Alan Rosevear, Faringdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 773,157, May 1, 1977, abandoned, which is a continuation of Ser. No. 587,201, Jun. 16, 1975, abandoned. This application Feb. 26, 1979, Ser. No. 15,405

Claims priority, application United Kingdom, Jun. 25, 1974, 28212/74

Int. Cl.[3] C12N *11/00, 11/04, 11/14*

U.S. Cl. 435—174 2 Claims

1. A method for the preparation of a porous support material having a biologically active substance immobilised in the pores thereof comprising selecting a porous support material having a pore size and pore structure that permits entry of a solution containing biologically active substance, introducing said solution into the pores of said porous support material so as to substantially fill the pore volume of said support material, freeze-drying the volume of said solution introduced into the pores so as to retain said biologically active substance in the pores of the porous support material and hold the biologically active substance available for cross-linking, cross-linking the biologically active substance in the pores of the porous support material, said introduction of solution of containing biologically active substance and said freeze-drying being conducted so as to provide a major proportion of the immobilised biologically active substance in the pores of, rather than on the external surface of, the porous material.

4,323,651

THERMOSTABLE LACTASE DERIVED FROM BACILLUS

Margaret E. Long, and Chin K. Lee, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 63,668, Aug. 6, 1979, abandoned, which is a division of Ser. No. 660,094, Feb. 23, 1976, Pat. No. 4,197,335, which is a continuation-in-part of Ser. No. 529,329, Dec. 4, 1974, abandoned. This application Oct. 2, 1980, Ser. No. 193,169

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.[3] C12N *9/38, 1/20*

U.S. Cl. 435—207 4 Claims

1. A lactase having improved thermal stability and exhibiting at about pH 6.0 optimum activity for catalyzing the hydrolysis of lactose to glucose and galactose, said lactase being further characterized as being derived from an organism belonging to the species *Bacillus coagulans* and having sufficient thermal stability so that at least 50 percent of its activity is retained after heating for one hour at 60° C. as determined by assaying lactase activity associated with washed cells of said organism suspended in a 0.05 M phosphate buffer at pH 7.0 in the presence of σ-nitrophenyl-β-galactoside.

3. A biologically pure culture of a strain of the microorganism *Bacillus coagulans* which when cultivated in a suitable nutrient medium is capable of producing lactase having sufficient thermal stability so that at least 50 percent of its activity is retained after heating for one hour at 60° C. as determined by assaying lactase activity associated with washed cells of said microorganism suspended in a 0.05 M phosphate buffer at pH 7.0 in the presence of σ-nitrophenyl-β-galactoside.

4,323,652

STARTING MIXTURE FOR A DIELECTRIC COMPOSITION, SCREEN PRINTING PASTE HAVING SUCH A STARTING MIXTURE, AND PRODUCT OBTAINED

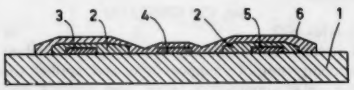
Hugues Baudry, Villecresnes; Claude Morhaim, Paris, and Dominique Bricout, Evreux, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1980, Ser. No. 130,282

Claims priority, application France, Mar. 23, 1979, 7907355

Int. Cl.[3] H01B *3/02;* C03C *3/04, 3/22;* C04B *35/00*

U.S. Cl. 501—17 6 Claims



1. A composition suitable for forming a dielectric composition consisting essentially of 85 to 60% by volume of a vitreous phase and 15 to 40% by volume of a ceramic phase, said ceramic phase consisting essentially of zinc oxide or of a mixture of zinc oxide and cobalt oxide and said vitreous phase having the following composition by mol percent: 30–50% SiO_2, 20–40% ZnO, 0–20% B_2O_3, 0–10% Al_2O_3, 5–40% CaO+SrO+BaO and, as a coloring oxide, 0–10% of CoO.

4,323,653

INHIBITING CRYSTALLIZATION OF OPAL GLASS COMPOSITIONS

Hans J. Holland, Painted Post, and John E. Megles, Jr., Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,901

Int. Cl.[3] C03C *3/08*

U.S. Cl. 501—32 2 Claims

1. A spontaneous opal glass composition which limits the development of CaF_2 crystals and crystals of xonotlite structure therein, when the glass is heated at temperatures in excess of the annealing point but less than the softening point thereof, consisting essentially, as analyzed in weight percent on the oxide basis, of about:

SiO_2	64.5 ± 2.0
Al_2O_3	6.25 ± 0.5
Na_2O	3.0 ± 0.5
K_2O	3.0 ± 0.5
MgO	1.25 ± 0.3
B_2O_3	4.5 ± 0.7
F	3.25 ± 0.5
CaO	14.5 ± 1.0

4,323,654

MOLDABLE GLASS COMPOSITIONS

Paul A. Tick, Corning, and Leon M. Sanford, deceased, late of Campbell, N.Y. (by Michele R. Sanford, administratrix), assignors to Corning Glass Works, Corning, N.Y.

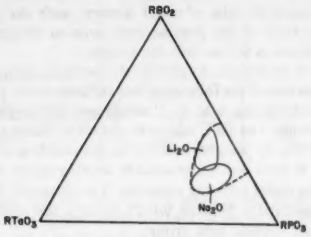
Filed Mar. 26, 1981, Ser. No. 248,001

Int. Cl.[3] C03C *3/14, 3/16*

U.S. Cl. 501—47 3 Claims

1. A glass article having a composition consisting essentially, in mole percent, of about 18–35% P_2O_5, 7–25% B_2O_3, 3–14% Ta_2O_5, and 33–67% R_2O, wherein R_2O consists of one or more

alkalli metal oxides selected from the group consisting of Li_2O, Na_2O and K_2O, the glass forming the article exhibiting a glass



transition temperature below 500° C. and a refractive index value (n_d) exceeding about 1.523.

4,323,655

RUBBER-MODIFIED FIRE-RETARDANT ANHYDRIDE COPOLYMERS

Adolph V. DiGiulio, and Jack N. Bauer, both of Pittsburgh, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 147,666, May 7, 1980, Pat. No. 4,278,768. This application Feb. 17, 1981, Ser. No. 235,355

Int. Cl.³ C08V *9/06, 9/12*

U.S. Cl. 521—88 5 Claims

1. A fire-retardant foam composition having a density of between 1 and 10 pounds per cubic foot and consisting of a rubber-modified copolymer, from 10 to 20 parts per hundred parts of copolymer of an at least tribrominated diphenylether, and 4 to 8 parts per hundred parts of copolymer of a metal oxide synergist for the ether; said rubber-modified copolymer consisting of (a) 5 to 40 weight percent of a rubber, selected from the group consisting of homopolymers of butadiene, isoprene, chloroprene and piperylene; copolymers of said conjugated diene with up to 50 weight percent of one or more monoolefinically unsaturated monomers selected from the group consisting of styrene, substituted styrenes, acrylonitrile, methacrylonitrile and isobutylene; ethylenepropylene-diene terpolymer rubbers; acrylate-diene copolymer rubbers; and mixtures thereof and (b) 60 to 95 weight percent of a copolymer of 50 to 95 mole percent of a monovinyl aromatic monomer and 5 to 50 mole percent of the anhydride of an ethylenically unsaturated dicarboxylic acid monomer.

4,323,656

POLYURETHANE SPONGES MANUFACTURED WITH ADDITIVE DISPERSED THEREIN

Robert L. Strickman, 729 Handwerg Dr., River Vale, N.J. 07675, and Melvyn B. Strickman, Academy St., Shiloh, N.J. 08353

Continuation of Ser. No. 305,870, Nov. 13, 1972, abandoned. This application Oct. 30, 1978, Ser. No. 955,881

Int. Cl.³ A47L *13/17;* C08G *18/16;* C08J *5/14;* C11D *17/04*

U.S. Cl. 521—109 1 Claim

1. A method for manufacturing a resilient scouring product characterized by the feature that a hot mass of abrasive particles is thoroughly mixed with a mixture of an aryl diisocyanate and a polyether, including as a catalyst an alkali metal or ammonium salt of alginic acid, and the mass is allowed freely to expand and cure thereby to form a synthetic sponge structure.

4,323,657

DISPERSIONS OF HIGH MELTING POLYESTERS IN POLYHYDROXYL COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN THE PRODUCTION OF POLYURETHANES

Jan Mazanek; Roland Gipp, both of Cologne; Robert Zöllner, Leverkusen; Peter Seifert, Bergisch Gladbach; Küuno Wagner, Leverkusen, and Johannes Blahak, Munich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,367

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913458

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—116 13 Claims

1. A dispersion comprising

(a) 1 to 40% by weight based on the whole dispersion of a polyester, polyester amide or segmented copolyether ester having a melting point above 100° C., as the disperse phase; in

(b) 99 to 60% by weight based on the whole dispersion of a polyhydroxyl compound having a melting point below 50° C. and a molecular weight of from 62 to 12,000 and in which said disperse phase is substantially insoluble, as the continuous phase;

said disperse phase further characterized as containing more than 50% by weight of dispersed particles in a size range of from 0.05 to 10μ.

4,323,658

POLYISOCYANURATES FROM DIOLS MODIFIED WITH EPOXY RESINS

George P. Speranza, and Robert L. Zimmerman, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,610

Int. Cl.³ C08G *18/14, 18/48, 18/32*

U.S. Cl. 521—174 22 Claims

1. A modified polyether polyol being produced by a method comprising the following steps

(a) mixing a low molecular weight polyol initiator having a hydroxyl functionality of less than three with an epoxy resin,

(b) heating the mixture in (a) to a temperature between about 70° C. to 115° C. for a period of time and

(c) adding to the heated mixture one or more alkylene oxides.

15. An improved rigid polyisocyanurate foam produced by the reaction of a modified polyol, an organic polyisocyanate and a foam catalyst wherein the improvement comprises making the modified polyol by a method comprising the following steps

(a) mixing a low molecular weight polyol initiator having a hydroxyl functionality of less than three with an epoxy resin,

(b) heating the mixture in (a) to a temperature between about 70° C. to 115° C. for a period of time and

(c) adding to the heated mixture one or more alkylene oxides.

4,323,659

NON-FLAMMABLE ADHESIVE COMPOSITIONS

Masanao Watanabe; Keiichi Naito; Tooru Odajima, and Yoshio Fujiwara, all of Kanuma, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 212,801

Int. Cl.³ C08L *63/00*

U.S. Cl. 525—108 11 Claims

1. A non-flamable adhesive composition comprising 100 parts by weight of a brominated epoxy resin, 40–80 parts by weight of an acrylic copolymer and 5–20 parts by weight of a brominated polyvinylphenol, said acrylic copolymer being prepared by copolymerizing (a) 5–35% by weight of acryloni-

trile, (b) 0.5–10% by weight of an ethylenically unsaturated compound having at least one functional group selected from carboxyl group, hydroxyl group and epoxy group, and (c) substantially the balance of an ester obtainable from an alcohol having from 1 to 6 carbon atoms and acrylic acid and/or methacrylic acid.

4,323,660

COMPOSITION WITH LATENT REACTIVE CATALYST - #5

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1980, Ser. No. 109,437
Int. Cl.³ C08L *37/00, 61/28*
U.S. Cl. 525—161 **10 Claims**

1. A composition of which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a sulfonic acid ester comprising the reaction product of

(i) a bifunctional copolymer bearing pendent epoxy functionality and at least 2 hydroxyl groups per molecule, and having a number average molecular weight (M_n) of between about 1,500 and about 10,000 and a glass transition temperature (T_g) of between about −25° C. and about 70° C., said copolymer being prepared from (a) between about 0.5 and about 5 weight percent of monethylenically unsaturated monomers bearing glycidyl functionality, (b) between about 10 and about 30 weight percent of monoethylenically unsaturated monomers bearing hydroxyl functionality, and (c) between about 65 and about 89.5 weight percent of other monoethylenically unsaturated monomers, and

(ii) a sulfonic acid having the formula

wherein R is selected from linear or branched alkyl groups and aryl groups, said epoxy functional polymer and said sulfonic acid being reacted in such amounts that there are between about 0.3 and about 1 acid groups per epoxy in the reaction mixture; and

(B) an amine-aldehyde crosslinking agent in an amount ranging from about 15 to about 45 weight percent based on the total weight of (A) and (B).

4,323,661

SINTERABLE, FINELY DIVIDED VINYL CHLORIDE MOLDING COMPOSITION AND A PROCESS FOR ITS MANUFACTURE AND USE

Helmut Kraus, Töging; Jürgen Weinlich, Eppstein, and Otto Plewan, Neuötting, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,581
Claims priority, application Fed. Rep. of Germany, May 17, 1980, 3018522
Int. Cl.³ C08F *265/04*
U.S. Cl. 525—259 **10 Claims**

1. Sinterable, finely divided molding composition, based on polyvinyl chloride having a K-value of 55 to 75, a bulk density of 450 to 700 g/l, a plasticizer absorption of 5 to 20% by weight, a content of metal cations of less than 0.01% by weight, relative to the molding composition, an average particle size of 10 to 50 μm and a particle size distribution of 99 to 30% by weight <33 μm, 1 to 60% by weight from 33 to 63 μm, 0 to 9% by weight from 63 to 125 μm and 0 to 1% by weight >125 μm, which consisting essentially of:

99.8 to 97% by weight, relative to the molding composition, of a graft copolymer which has been prepared by suspension polymerization of vinyl chloride in the presence of an ethylene/vinyl acetate copolymer in an aqueous phase and which is in turn composed of 99.7 to 85% by weight, relative to the graft copolymer, of polymerized units of vinyl chloride, 0.09 to 10.5% by weight, relative to the graft copolymer, of polymerized units of ethylene and 0.09 to 10.5% by weight, relative to the graft copolymer, of polymerized units of vinyl acetate, with the proviso that the total of the polymerized units of ethylene and vinyl acetate is 0.3 to 15% by weight;

0.01 to 0.5% by weight, relative to the molding composition, of at least one of the following free sulfonic acids: alkylsulfonic acids having 8 to 16 C atoms and alkylarylsulfonic acids having 3 to 16 C atoms in the alkyl chain; and

0.005 to 0.5% by weight, relative to the molding composition, of at least one water-soluble wetting agent which is free from metal ions and contains 12 to about 80 C atoms and a quaternary N atom which forms a salt with a carboxylic or sulfuric acid group;

the remainder being: suspending agents, residues of activators and other polymerization auxiliaries and also, in some cases, small quantities of further additives.

4,323,662

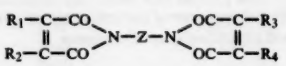
THERMOSETTING RESIN COMPOSITIONS COMPRISING BISMALEIMIDES AND ALKENYLANILINE DERIVATIVES

Masayuki Oba; Motoo Kawamata; Hikotada Tsuboi, and Nobuhito Koga, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jul. 8, 1980, Ser. No. 167,145
Claims priority, application Japan, Jul. 10, 1979, 54/86429
Int. Cl.³ C08F *220/52, 222/40, 122/40, 271/02*
U.S. Cl. 525—281 **11 Claims**

1. A thermosetting resin composition comprising:

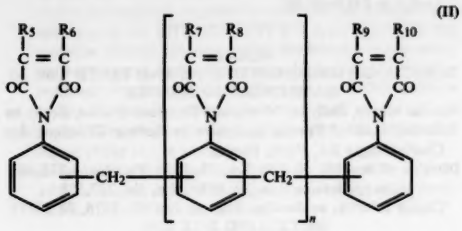
(a) at least one maleimide selected from the group consisting of bismaleimides having the formula



(I)

where R_1, R_2, R_3, and R_4 are hydrogen atoms, halogen atoms, straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms, phenyl radicals, or substituted phenyl radicals having one or more substituents selected from straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms, halogen atoms, $R_{13}O$— groups in which R_{13} is an aliphatic radical of from 1 to 5 carbon atoms and, if there are two or more radicals represented by R_{13}, they may be identical to or different from each other,

groups in which R_{13} is as previously defined, hydroxyl groups, and cyano groups, and the radicals represented by R_1, R_2, R_3, and R_4 may be identical to or different from each other, and Z is a divalent organic radical of at least 2 carbon atoms and polymaleimides having the formula

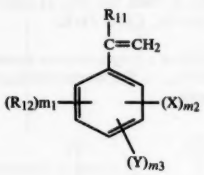


(II)

where R_5, R_6, R_7, R_8, R_9, and R_{10} are hydrogen atoms, halogen atoms, straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms, phenyl radicals, or substituted phenyl radicals having one or more substituents selected from halogen atoms, straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms, $R_{13}O$— groups in which R_{13} is as previously defined,

groups in which R_{13} is as previously defined, hydroxyl groups, and cyano groups, and the radicals represented by R_5, R_6, R_7, R_8, R_9, and R_{10} may be identical to or different from each other, and n is zero or a positive number; and

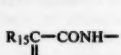
(b) at least one member selected from the group consisting of alkenylaniline derivatives having the formula



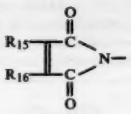
(III)

where R_{11} and R_{12} are hydrogen atoms, halogen atoms, straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms, phenyl radicals, or substituted phenyl radicals having one or more substituents selected from halogen atoms, straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms, $R_{13}O$— groups in which R_{13} is as previously defined, and cyano groups, and the radicals represented by R_{11} and R_{12} may be identical to or different from each other, X is a hydrogen atom, halogen atom, carboxyl group,

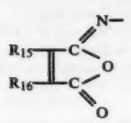
group in which R_{13} is as previously defined, $R_{13}O$— group in which R_{13} is as previously defined, or cyano group, Y is an amino group, maleimido glycidylamino group, diglycidylamino group,



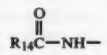
group in which R_{15} and R_{16} are hydrogen atoms, halogen atoms, or straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms and the radicals represented by R_{15} and R_{16} may be identical to or different from each other,



group in which R_{15} and R_{16} are as previously defined,



group in which R_{15} and R_{16} are as previously defined,



group in which R_{14} is an aliphatic radical of from 1 to 20 carbon atoms, an alkylamino group of from 1 to 5 carbon atoms, or a dialkylamino group in which each alkyl radical has from 1 to 5 carbon atoms, and m_1, m_2, and m_3 are positive integers and the sum of $m_1+m_2+m_3$ has a value of 5, linear dimers thereof, and polymers thereof.

4,323,663

PROCESS FOR PRODUCING A HALOGEN-CONTAINING POLYCARBONATE RESIN

Hazime Mori; Katsuhisa Kohyama, and Katsuhiko Nakamura, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Nov. 3, 1980, Ser. No. 203,649

Claims priority, application Japan, Nov. 20, 1979, 54-150254

Int. Cl.³ C08L 69/00; C08G 63/62

U.S. Cl. 525—470 **9 Claims**

1. A process for producing a halogen-containing polycarbonate resin characterized by washing, with an aqueous washing liquid, an organic solvent solution of a mixture of a first halogen-containing polycarbonate resin prepared by a process using phosgene as a reactant, said first polycarbonate resin having a halogen content of not less than 4 wt% and a second polycarbonate resin having a halogen content of not larger than 4 wt% and present in said mixture in an amount 0.05–4 times the weight of said first polycarbonate resin, and collecting a mixed polycarbonate resin having a halogen content of not less than 4 wt% from said solution.

4,323,664

PROCESS FOR PRODUCING GRANULAR POLYMER HAVING UNIFORM FINE PARTICLE SIZE

Yoshiyuki Mukoyama, and Nobutoshi Chikazumi, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 107,762

Claims priority, application Japan, Jan. 11, 1979, 54-2422

Int. Cl.³ C08F 2/20

U.S. Cl. 526—88 **9 Claims**

1. A process for producing a granular polymer having a fine particle size by aqueous suspension polymerization which comprises conducting aqueous suspension polymerization of one or more crosslinkable polymerizable monomers, non-crosslinkable polymerizable monomers or a mixture thereof in the presence of a suspension agent under stirring accompanying high speed shearing at a rate of shear in the range of 10^5 to

5×10^6 min^{-1} until the percentage conversion becomes 1 to 50% and continuing the polymerization under stirring without the accompanying high speed shearing and without mechanical cutting; said non-crosslinkable polymerizable monomer being a styrene series monomer or an acrylic series monomer.

4,323,665
HIGH EFFICIENCY CATALYST FOR POLYMERIZING OLEFINS

Kirby Lowery, Jr., Lake Jackson; Donald F. Birkelbach, Angleton, and Randall S. Shipley, Alvin, all of Tex., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 27,974, Apr. 9, 1979, Pat. No. 4,224,186, which is a continuation-in-part of Ser. No. 939,632, Sep. 5, 1978, abandoned. This application Apr. 14, 1980, Ser. No. 140,408

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—122 **24 Claims**

1. In a process for the polymerization of an α-olefin under the conditions characteristic of Ziegler polymerization wherein the polymerization is conducted in the presence of, as a catalyst for said polymerization, a catalytic reaction product of (A) a tetravalent titanium compound, (B) an organoaluminum compound, (C) an organomagnesium component and (D) a halide source; said catalytic reaction product having atomic ratios of

Mg:Ti is from about 1:1 to about 2000:1,

Al:Ti is from about 0.1:1 to about 2000:1;

excess X:Al is from about 0.0005:1 to about 10:1;

the improvement which comprises employing as the halide source in said catalyst, a tetravalent tin halide represented by the formula SnX_aR_{4-a}, wherein X is a halogen, R is a hydrocarbyl or hydrocarbyloxy group and a has a value of 1 to 4 and the atomic ratio of Sn:Mg is from about 0.1:1 to about 2:1.

4,323,666
COPOLYMERS OF VINYL ACETATE, ETHYLENE AND PEROXY ALKYL ACRYLATE

Vram T. Shirinian, ulitsa Proletarskaya, 58, kv. 21; Suren S. Mnatsakanov, prospekt Metallistov, 50, kv. 165; Valery N. Pavljuchenko, prospekt Energetikov, 34, kv. 53; Mark E. Rozenberg, Kondratievsky prospekt, 79, kv. 159; Valery V. Gromov, ulitsa Vernosti, 38, korpus 3, kv. 80, and Sergei S. Ivanchev, ulitsa Nalichnaya, 36/3, kv. 97, all of Leningrad, U.S.S.R.

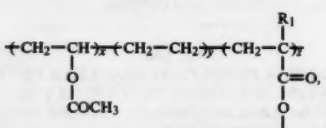
PCT No. PCT/SU79/00024, § 371 Date Dec. 12, 1980, § 102(e) Date Dec. 12, 1980, PCT Pub. No. WO80/02289, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 24, 1979, Ser. No. 227,062

Int. Cl.³ C08F *210/02, 220/28*

U.S. Cl. 526—329 **1 Claim**

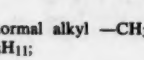
1. Copolymers of vinyl acetate, ethylene and peroxy alkyl acrylate of the general formula:



wherein

R_1 represents a normal alkyl $-CH_3$, $-C_2H_5$, $-C_3H_7$, $-C_4H_9$, or $-C_5H_{11}$;

R_2 represents



or $-O-C(CH_3)_3$;

x=24.0 to 89.9 mole %; y=10.0 to 75.0 mole %; z=0.1 to 1.0 mole %.

4,323,667
BORIC ANHYDRIDE SOLUTIONS AND THEIR USE AS HARDENERS OF RESOLS

Nicolas Meyer, Bully les Mines, and Raymond Foulon, Bruay en Artois, both of France, assignors to Societe Chimique des Charbonnages SA, Paris, France

Division of Ser. No. 49,009, Jun. 15, 1979, Pat. No. 4,272,403. This application Jan. 22, 1981, Ser. No. 227,308

Claims priority, application France, Jun. 19, 1978, 78 18279

Int. Cl.³ C08G *8/32, 8/36*

U.S. Cl. 528—138 **11 Claims**

1. In a process for hardening formo-phenolic resols, wherein a mixture comprising a formo-phenolic resin and a hardening agent is hardened;

the improvement wherein said hardening agent is a concentrated boric anhydride solution which comprises (1) at least 5 percent by weight of boric anhydride; (2) at least one solvent selected from the group consisting of mono alcohols, poly alcohols, trialkylborates and dialkyl acetals of formol; and (3) from 5 to 70 percent by weight, based on the weight of solution, of at least one acid selected from the group consisting of sulfuric acid and sulfonic acids.

4,323,668
(ORTHO-ALKOXYCARBONYARYL)-CARBONATE TRANSESTERIFICATION

Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1980, Ser. No. 212,386

Int. Cl.³ C08G *63/62*

U.S. Cl. 528—173 **9 Claims**

1. A process for effecting a polycarbonate transesterification which comprises reacting a bis (ortho-alkoxycarbonylaryl) carbonate of the formula

and a dihydric phenol under transesterification reaction conditions where at least a P or Q substituent is an ortho-positioned —COOR group, R being a C_{1-4} alkyl directly bonded to a ring carbon atom located adjacent to an oxo group of the carbonate, i and j represent whole numbers of at least 1 up to a maximum equivalent to the number of replaceable hydrogen atoms or C_{1-4} alkyl groups substituted for on the aromatic rings comprising Ar and Ar'.

4,323,669
PROCESS FOR PURIFICATION OF NITROCELLULOSE

William T. Bolleter, Blacksburg, and Carl D. Chandler, Jr., Dublin, both of Va., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jul. 23, 1980, Ser. No. 171,623

Int. Cl.³ C08B *5/04, 5/10*

U.S. Cl. 536—38 **4 Claims**

1. A process is provided for purification and viscosity reduction of unpurified nitrocellulose containing residual acid from the nitration step in the preparation of the nitrocellulose, said process comprising:

(a) cutting the unpurified nitrocellulose fibers in water forming an aqueous slurry of nitrocellulose fibers comprising a dispersed nitrocellulose fiber phase and a continuous liquid phase,

(b) adjusting the pH of such slurry to at least about 8 with the basic solution,

(c) heating the resulting slurry to an elevated temperature of

at least 100° C. to about 150° C. and at a pressure of from about atmospheric pressure to about 60 psi (gauge), and maintaining the pH of the slurry at at least about 8 by the addition of basic solution during the heating of the slurry under pressure and continuing said heating for a time sufficient for the residual acid in said nitrocellulose fibers to be substantially completely neutralized,

(d) separating the neutralized fibers from the continuous liquid phase of the slurry, and

(e) washing the separated nitrocellulose fibers with water to effect removal of the basic solution and recovering stable nitrocellulose fibers therefrom.

4,323,670

ANTHRAQUINONE-AZOMETHINE COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND PROCESSES FOR PIGMENTING ORGANIC MACROMOLECULAR SUBSTANCES

Rütger Neeff; Meinhard Rolf, and Walter Müller, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

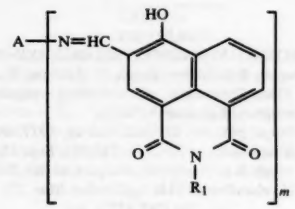
Filed Jul. 21, 1980, Ser. No. 170,444

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931711

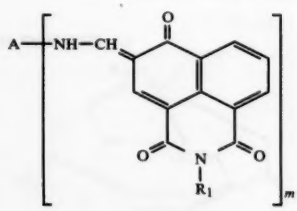
Int. Cl.³ C07D *221/06*

U.S. Cl. 542—415 **3 Claims**

1. An anthraquinone-azomethine compound of the formula



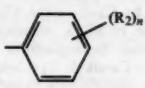
or of the tautomeric formula



in which

A denotes an anthraquinone radical which is free from sulphonic acid groups and is optionally further substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylamino, benzylamino, cyclohexylamino, C_1–C_4 alkylmercapto, phenylmercapto which is optionally substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, fluorine, chlorine, bromine or nitro, C_1–C_4 alkylcarbonyl, C_1–C_4 alkoxycarbonyl, phenylamino which is optionally substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, bromine, chlorine or nitro, carbamoyl which is optionally monsubstituted or disubstituted by C_1–C_4 alkyl, benzyl or phenyl, it being possible for phenyl to be substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, fluorine, chlorine, bromine or nitro, carboxyl, hydroxyl, C_1–C_4 alkylcarbonylamino, benzoylamino which is optionally substitued by C_1–C_4 alkyl, C_1–C_4 alkoxy, chlorine, bromine or nitro, C_1–C_4 alkyl sulphonylamino or benzenesulphonylamino which is optionally substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, fluorine, chlorine, bromine or nitro;

R_1 denotes hydrogen, an optionally substituted aryl group of the formula



wherein the aryl group can be substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, trifluoromethyl or cyano, hetero-aryl, cycloalkyl or C_1–C_{12} alkyl, it being possible for the alkyl chain to be interrupted by oxygen or sulphur and/or to be substituted by hydroxyl groups of $N(R_3)_2$ groups, $—N(R_3)_3$ or

R_2 denotes halogen, C_1–C_4 alkyl, C_1–C_4alkoxy, nitro, trifluoromethyl, cyano, optionally substituted carbamoyl optionally substituted sulphamoyl, acylamino or optionally substituted arylamino, the substituents on the optionally substituted carbamoyl or sulphamoyl being C_1–C_4 alkyl, phenyl which in turn is optionally substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, chlorine, bromine or nitro and benzyl, the substituents on the aryl amino being C_1–C_4 alkyl, C_1–C_4 alkoxy, fluorine, chlorine, bromine or nitro;

R_3 denotes hydrogen, C_1–C_4 alkyl, cycloalkyl or optionally substituted aryl where the substituents are halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, trifluoromethyl or cyano;

m denotes 1, 2, 3 or 4 and

n denotes 1, 1, 2, 3, 4 or 5.

4,323,671

ANTHRAQUINONE DERIVATIVES, PROCESSES FOR THEIR PREPARATION, PROCESSES FOR PIGMENTING ORGANIC MACROMOLECULAR SUBSTANCES, AND PIGMENTED ORGANIC MACROMOLECULAR MATERIAL

Rütger Neeff; Meinhard Rolf, and Walter Müller, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 140,348

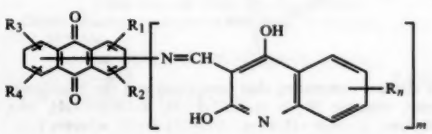
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917312

Int. Cl.³ C07D *215/22*

U.S. Cl. 542—415 **2 Claims**

1. Anthraquinone derivatives of the formula

(III)



or of the corresponding tautomeric formula, wherein

m denotes a number from 1 to 4,

R denotes a substituent and

n denotes 0, 1, 2, 3 or 4,

R_1 denotes hydrogen, halogen, such as fluorine, chlorine and bromine, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylamino, benzylamino, cyclohexylamino, C_1–C_4-alkylmercapto, phenylmercapto which is optionally substituted

by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine or nitro, C_1–C_4-alkylcarbonyl, C_1–C_4-alkoxycarbonyl, phenylamino which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine or nitro, carbamoyl which is optionally monosubstituted or disubstituted by C_1–C_4-alkyl, benzyl or phenyl, it being possible for phenyl to be substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine or nitro, carboxyl, hydroxyl, C_1–C_4-alkylcarbonylamino, benzoylamino which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine or nitro, or phenylsulphonylamino which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine or nitro,

R_2 denotes hydrogen, chlorine or hydroxyl,

R_3 denotes hydrogen, halogen, such as fluorine, chlorine or bromine, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylamino, C_1–C_4-alkylmercapto, phenylmercapto which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluroine, chlorine, bromine or nitro, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylcarbonyl, benzylamino, cyclohexylamino, phenylamino which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine or nitro, carboxyl, hydroxyl, carbamoyl which is optionally monosubstituted or disubstituted by C_1–C_4-alkyl, benzyl or phenyl, it being possible for phenyl to be substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine or nitro, C_1–C_4-alkylcarbonylamino, benzoylamino which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine or nitro, C_1–C_4-alkylsulphonylamino, or phenylsulphonylamino which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine or nitro and

R_4 denotes hydrogen, halogen, such as fluorine, chlorine and bromine, or hydroxyl.

4,323,672

PGI_2 AMIDES

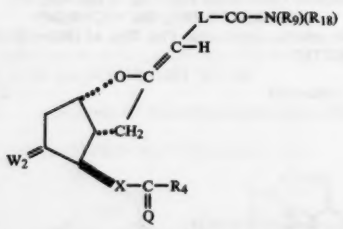
Roy A. Johnson, Kalamazoo; Frank H. Lincoln, Portage, and John E. Pike, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 819,940, Jul. 28, 1977, which is a continuation-in-part of Ser. No. 725,550, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,770, Aug. 23, 1976, abandoned. This application Mar. 27, 1981, Ser. No. 248,635

Int. Cl.³ C07D *307/935*

U.S. Cl. 542—421 **15 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof, wherein W_2 is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, or α—CH_2OH:β—H; wherein L is

(1) —$(CH_2)_d$—$C(R_2)_2$—,

(2) —CH_2—O—CH_2—Y—, or

(3) —CH_2CH=CH—,

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, —CH_2— or —$(CH_2)_2$—, wherein Q is oxo, α—H:β—H, α—R_8:β—OH, or α—OH:β—R_8, wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein R_9 is hydrogen, methyl, or ethyl, and wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive, wherein R_4 is

—$C(R_5)(R_6)C_gH_{2g}$—CH_3,

—$C(R_5)(R_6)$—Z—(Ph I), or

—CH_2—CH=CH—CH_2CH_3,

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6 and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen of fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6- and (Ph I); wherein (Ph I) is phenyl optionally substituted by one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_7— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that not more than two such substituents are other than alkyl and such substituents being either the same or different; and wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) —CH_2CH_2—;

including the lower alkanoates thereof.

4,323,673

2-DECARBOXY-2-AMINOMETHYL-PGI_2 COMPOUNDS

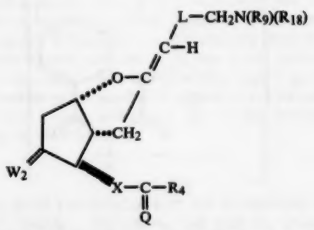
Roy A. Johnson, Kalamazoo; Frank H. Lincoln, Portage, and John E. Pike, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 819,940, Jul. 28, 1977, which is a continuation-in-part of Ser. No. 725,550, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,770, Aug. 28, 1976, abandoned. This application Mar. 27, 1981, Ser. No. 248,627

Int. Cl.³ C07D *307/935*

U.S. Cl. 542—426 **10 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof,

wherein W_2 is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, or α—CH_2OH:β—H;

wherein L is

(1) —$(CH_2)_d$—$C(R_2)_2$—,

(2) —CH_2—O—CH_2—Y—, or

(3) —CH_2CH=CH—,

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, —CH_2— or —$(CH_2)_2$—,

wherein Q is oxo, α—H:β—H, α—R_8:β—OH, or α—OH:βR_8, wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_9 is hydrogen, methyl, or ethyl, and wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive,

wherein R_4 is

$-C(R_5)(R_6)C_gH_{2g}-CH_3$,

$-C(R_5)(R_6)-Z-$(Ph I), or

$-CH_2-CH=CH-CH_2CH_3$,

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, between CR_5R_6— and (Ph I); wherein (Ph I) is phenyl optionally substituted by one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7-$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that not more than two such substituents are other than alkyl and such substituents being either the same or different; and wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—, (3) —C≡C—, or

(4) $-CH_2CH_2-$;

including the lower alkanoates thereof.

4,323,674
PGI_2 ANALOGS

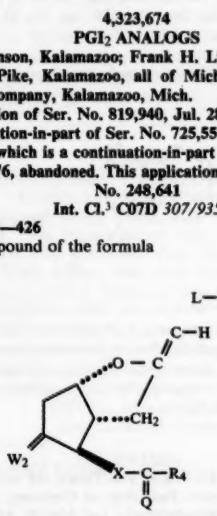
Roy A. Johnson, Kalamazoo; Frank H. Lincoln, Portage, and John E. Pike, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 819,940, Jul. 28, 1977, which is a continuation-in-part of Ser. No. 725,550, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,770, Aug. 23, 1976, abandoned. This application Mar. 27, 1981, Ser. No. 248,641

Int. Cl.³ C07D 307/935

U.S. Cl. 542—426 **29 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof, wherein W_2 is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, or α—CH_2OH:β—H; wherein L is

(1) $-(CH_2)_d-C(R_2)_2-$,

(2) $-CH_2-O-CH_2-Y-$, or

(3) $-CH_2CH=CH-$,

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$, wherein Q is oxo, α—H:β—H, α—R_8:β—OH, or α—OH:β—R_8, wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein R_3 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

(g) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,

(h) —(p—Ph)—NH—CO—(Ph),

(i) —(p—Ph)—NH—CO—CH_3,

(j) —(p—Ph)—NH—CO—NH_2,

(k) —(p—Ph)—CH=N—NH—CO—NH_2,

(l) 2-naphthyl,

(m) $CH(R_{11})$—CO—R_{10}, wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, wherein R_{11} is hydrogen or benzoyl, (Ph) is phenyl and (p-Ph) is 1,4-phenylene or

(n) a pharmacologically acceptable cation, with the proviso that R_3 is not hydrogen, a pharmacologically acceptable cation, or alkyl of one to 4 carbon atoms, inclusive, when Q and W_2 are both α—OH:β—H, L is $-(CH_2)_3$, X is trans—CH=CH—, and R_4 is $-(CH_2)_4-CH_3$;

wherein R_4 is

$-C(R_5)(R_6)C_gH_{2g}-CH_3$,

$-C(R_5)(R_6)-Z-$(Ph I), or

$-CH_2-CH=CH-CH_2CH_3$,

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and (Ph I); wherein (Ph I) is phenyl optionally substituted by one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7-$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that not more than two such substituents are other than alkyl and such substituents being either the same or different; and wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) $-CH_2CH_2-$;

including the lower alkanoates thereof.

4,323,675
NOVEL STILBENE COMPOUNDS: PROCESS FOR THEIR MANUFACTURE AND THEIR USE AS OPTICAL BRIGHTENERS

Helmut Eckes; Rüdiger Erckel, both of Eppstein; Thomas Martini, and Günter Rösch, both of Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

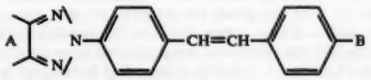
Filed Jun. 25, 1980, Ser. No. 162,930

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926234

Int. Cl.³ C07D 401/14, 413/10, 413/14

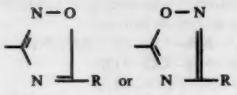
U.S. Cl. 542—463 **5 Claims**

1. A compound of the formula

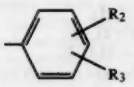


(1)

wherein A is a benzene or naphthalene ring which is unsubstituted or substituted by non-chromophoric substituents, B is a group of the formulae



and R is a straight-chain or branched alkyl group with 1–18 C-atoms, preferably 1–6 C-atoms, which is unsubstituted or substituted by hydroxyl groups, halogen atoms, lower alkoxy, dialkylamino, lower alkylmercapto, chloroaryloxy, aryloxy, arylmercapto, aryl, morpholine, piperidine or piperazine groups, or R is a group of the formula—$(CH_2CH_2O)_n$—R^1 with n being 1, 2 or 3 and R^1 being H, lower alkyl or R is dialkylaminoalkoxyalkyl, alkylthioalkoxyalkyl, piperidine-alkoxyalkyl, hexamethylenimine-alkoxyalkyl, morpholine-alkoxyalkyl or piperazine-alkoxyalkyl or R is a group of the formula



wherein R_2 and R_3 are identical or different and are selected from the group consisting of hydrogen, fluorine, chlorine, phenyl, lower alkyl, lower alkoxy, lower acylamino, or two adjacent radicals R_4 and R_5 form together a lower alkylene group, a fused benzene ring or a 1,3-dioxapropylene group.

4,323,676

PROCESS FOR PREPARING CEPHALOSPORINS

Susumu Tsushima, Suita; Michiyuki Sendai, Osaka, and Mitsuru Shiraishi, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

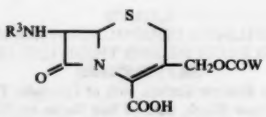
Division of Ser. No. 46,708, Jun. 8, 1979, Pat. No. 4,245,088, which is a continuation of Ser. No. 882,914, Mar. 2, 1978, abandoned, which is a continuation of Ser. No. 660,408, Feb. 23, 1976, abandoned. This application Aug. 29, 1980, Ser. No. 182,616

Claims priority, application Japan, Feb. 24, 1975, 50-23158; Mar. 21, 1975, 50-34714; Mar. 20, 1975, 50-33759; Jan. 1, 1976, 51-1274

Int. Cl.³ C07D *501/20*

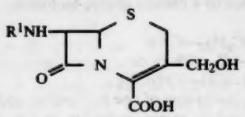
U.S. Cl. 544—22 **29 Claims**

1. A process for producing a compound of the formula:



wherein W represents —X—COOH, in which X is a carbon chain which is capable of forming a five- or six-membered ring with

which carbon chain may include a double bond or at least one atom selected from the group consisting of oxygen, nitrogen and sulfur, and on which carbon chain one or more substituents may be attached, the substituent being selected from the group consisting of carboxyl, halogen, nitro, alkyl having up to 3 carbon atoms, aralkyl, aryl, hydroxy substituted by one of said groups and mercapto substituted by one of said groups, and, when two or more of the substituents are present the substituents may form a ring with the carbon chain, and R^3 represents an acyl group, or a salt of said compound, which comprises the step of reacting a compound of the formula:



wherein R^1 represents hydrogen or an acyl group, or a salt of said compound, with a compound of the formula:

wherein X has the same meaning as defined hereinbefore.

4,323,677

N-AMIDES OF 2-BENZOTHIAZOLINONE

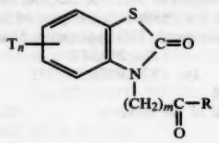
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 861,476, Dec. 16, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,483

Int. Cl.³ C07D *277/62, 265/28*

U.S. Cl. 544—135 **4 Claims**

1. An N-amide of 2-benzothiazolinone characterized by the formula



wherein T is trifluoromethyl and halo, n is 0 or 1; m is an integer from one to four; and R is selected from the group consisting of heterocyclics selected from the group consisting of cis- and trans-2,6-dimethylmorpholino, cis- and trans-2,5-dimethylpyrrolidino, 3-azabicyclo (3.2.2) nonyl, and ethyl N-piperazinocarboxylate.

4,323,678

PROCESS FOR THE MANUFACTURE OF DIAZINON

Bernd Schilling, Munich, Fed. Rep. of Germany, assignor to Consortium fur elektrochemische Ind. GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,411

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907773

Int. Cl.³ C07F *9/65*

U.S. Cl. 544—243 **4 Claims**

1. In a process for the manufacture of diazinon, the improvement comprising the steps of:

cyclizing β-isobutyrylaminocrotonic acid amide with 1 to 1.2 times the molar amount of a substance of the general formula NaOR, in which R represents hydrogen or an alkyl group having 1 to 8 carbon atoms, in a mixture of 0 to 100% by weight of water and an alcohol having 1 to 8 carbon atoms, above 90° C. but below the boiling point of the alcohol/water mixture used;

precipitating the resulting sodium pyrimidinolate by a non-

polar solvent which is inert toward the alcoholate and which has a boiling point above that of the alcohol used; and

after removing the alcohol/water mixture by fractionation, reacting the precipitated sodium pyrimidinolate directly with diethylthiophosphoryl chloride at a temperature of 100° to 130° C. to form diazinon.

4,323,679

PYRIMIDO(4,5-c)PYRIDAZINES

Robert W. Morrison, Jr.; William R. Mallory, and Virgil L. Styles, all of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

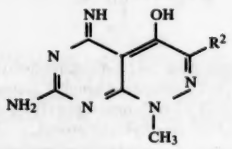
Division of Ser. No. 922,545, Jul. 7, 1978, Pat. No. 4,225,710. This application May 27, 1980, Ser. No. 153,059

Claims priority, application United Kingdom, Jul. 8, 1977, 28765/77

Int. Cl.³ C07D *487/04;* A61K *31/505*

U.S. Cl. 544—256 1 Claim

1. A compound of the formula (VI)



(VI)

wherein R^2 is, lower alkanoic acid acyloxymethyl, phenyl, indolyl, indolylmethyl, CH(CN) $CH_2C_6H_5$, $CH(CN)CH_2C_6H_5$ substituted in the phenyl ring with lower alkoxy, $CH_2CH_2CO_2Z$ where Z is hydrogen or C_{1-4} alkyl.

4,323,680

4-AMINOQUINAZOLINE COMPOUNDS USEFUL AS AGRICULTURAL FUNGICIDES

Kazuto Nakagami; Shinji Yokoi, both of Yasumachi; Kenji Nishimura, Ube; Shigeki Nagai, Ube; Takeo Honda, Ube; Kiroku Oda, Ube; Katsutoshi Fujii, Ube; Ryuji Kobayashi, Ube, and Mikio Kojima, Ube, all of Japan, assignors to Sankyo Company Limited, Tokyo and Ube Industries, Ltd., Ube, both of, Japan

Division of Ser. No. 910,117, May 30, 1978, Pat. No. 4,213,987. This application Mar. 28, 1980, Ser. No. 134,794

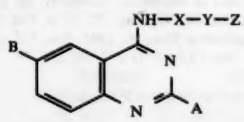
Claims priority, application Japan, Jun. 7, 1977, 52-67034

The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.

Int. Cl.³ C07D *239/94*

U.S. Cl. 544—293 15 Claims

1. A compound having the formula



wherein:

A and B each represents a hydrogen atom;

X represents an alkylene group;

Y represents an oxygen atom or a sulfur atom; and

Z represents an unsubstituted phenyl group or a phenyl group substituted with 1 to 3 substituents which are the same or different and selected from the group consisting of a lower alkyl group, a lower alkoxy group, a lower alkylthio group, a phenyl group, a trifluoromethyl group and a halogen atom; or a salt thereof.

4,323,681

4-AMINO-2-SUBSTITUTED-5-PYRIMIDINECARBOXAMIDOXIMES AND CARBOTHIOAMIDES

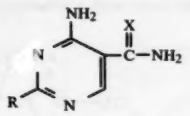
Milton Wolf, West Chester, and Richard L. Fenichel, Wyncote, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,120

Int. Cl.³ C07D *239/46, 239/38;* A61K *31/505*

U.S. Cl. 544—323 3 Claims

1. A compound of the formula:



wherein X is NOH, and R is hydrogen, alkyl of 1–4 carbon atoms, alkylthio of 1–4 carbon atoms, amino, phenyl or phenyl substituted with fluoro, chloro, bromo, monoalkyl of 1–4 carbon atoms, dialkyl of 1–4 carbon atoms in each alkyl group, alkoxy of 1–4 carbon atoms, trifluoromethyl, carbamoyl or dialkylcarbamoyl of 1–4 carbon atoms in each alkyl moiety and the pharmaceutically acceptable salts thereof.

4,323,682

QUINOXALINES AND THEIR USE IN PHOTOGRAPHIC PROCESSES

Gerald Jan; Remon Hagen, and John Lenoir, all of Marly, Switzerland, assignors to Ciba Geigy AG, Basel, Switzerland

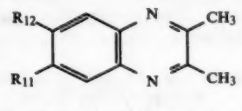
Division of Ser. No. 15,384, Feb. 26, 1979, Pat. No. 4,202,698, which is a continuation-in-part of Ser. No. 799,020, May 20, 1977, abandoned. This application Oct. 26, 1979, Ser. No. 88,727

Claims priority, application Switzerland, May 24, 1976, 6521/76

Int. Cl.³ C07D *241/42*

U.S. Cl. 544—353 3 Claims

1. A quinoxaline, which corresponds to the formula



in which R_{11} is methyl or ethyl and R_{12} is —OH, —OCH_3, —$NHCOCH_3$ or —$NHSO_2CH_3$.

4,323,683

PROCESS FOR MAKING PYRIDINETHIONE SALTS

Raymond E. Bolich, Jr., Maineville; Steven A. Shaya, Cincinnati, and Christian Steuri, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 7, 1980, Ser. No. 119,346

Int. Cl.³ C07D *213/89*

U.S. Cl. 546—6 11 Claims

1. A process for making heavy metal, magnesium or aluminum N-hydroxy pyridinethione salts comprising reacting 1-hydroxy-2-pyridinethione or a water soluble salt thereof with a water soluble heavy metal, magnesium or aluminum salt in an aqueous surfactant medium, wherein the reaction temperature is at least about 20° C.

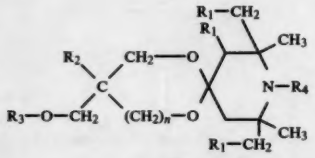
4,323,684

PROCESS FOR PREPARING A 2,2,6,6-TETRAALKYL-4-PIPERIDYL SPIRO ALIPHATIC ETHER

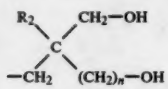
Naohiro Kubota, 404-1 Ageomura, Ageo, and Toshihiro Shibata, 136-49-3-104 Nara-cho, Omiya, both of Japan

Filed Aug. 5, 1980, Ser. No. 175,487
Claims priority, application Japan, Aug. 8, 1979, 54-100916
Int. Cl.³ C07D *491/13*
U.S. Cl. 546—19 **10 Claims**

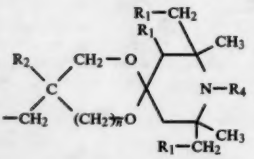
1. In a process for preparing a 2,2,6,6-tetraalkyl-4-piperidyl spiro aliphatic ether compound represented by the formula



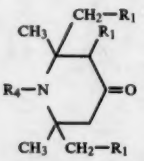
or an acid addition salt thereof, in which R_1 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, R_2 is a hydrogen atom, or a methyl, ethyl, or hydroxymethyl group, n is zero or one, R_3 is a group represented by a formula



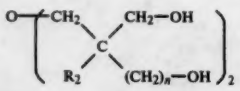
or



and R_4 is a hydrogen atom or an alkyl group, comprising the reaction of a 2,2,6,6-tetraalkyl-4-piperidone compound represented by the formula



or an acid addition salt thereof with an oxybis (alkanediol) compound represented by the formula



in which reaction water is formed, the improvement comprising carrying out the reaction of the 2,2,6,6-tetraalkyl-4-piperidone compound and the oxybis (alkanediol) compound in the presene of a polar solvent selected from the group consisting of alcohols having 1 to 13 carbon atoms and 1 alcoholic hydroxyl group, and amides of carboxylic acids having 1 to 4 carbon atoms.

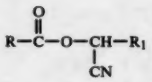
4,323,685

PREPARATION OF ESTERS

Jonathan S. Baum, 148 S. Main St., Pennington, N.J. 08534, assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 159,338, Jun. 13, 1980, Pat. No. 4,254,052, which is a continuation-in-part of Ser. No. 79,610, Sep. 27, 1979, abandoned. This application Feb. 12, 1981, Ser. No. 233,795
The portion of the term of this patent subsequent to Mar. 3, 1998, has been disclaimed.
Int. Cl.³ C07C *121/75;* C07D *213/64*
U.S. Cl. 546—300 **9 Claims**

1. A process for preparing an insecticidal α-cyano-3-phenoxybenzyl ester of the formula



wherein R is selected from 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropyl, 3-(2,2-dibromoethenyl)-2,2-dimethylcyclopropyl, 3-(2-chloro-3,3,3-trifluoropropenyl)-2,2-dimethylcyclopropyl, 2,2,3,3-tetramethylcyclopropyl, 1-(4-chlorophenyl)-2-methylpropyl, 1-(4-difluoromethoxyphenyl)-2-methylpropyl, and 1-[(2-chloro-4-trifluoromethyl)amino]-2-methylpropyl and R_1 is selected from 3-phenoxyphenyl, 4-fluoro-(3-phenoxy)phenyl, 3-(4-halophenoxy)phenyl, and 6-phenoxy-2-pyridyl which comprises reacting an acyl halide of the formula

wherein X is chlorine or bromine and R is as defined above with 3-phenoxybenzaldehyde, 4-fluoro-3-phenoxybenzaldehyde, a 3-(4-halophenoxy)benzaldehyde, or 6-phenoxy-2-pyridylcarboxaldehyde in a mixture of substantially water-immiscible aprotic solvent and an aqueous solution of water-soluble cyanide salt in the presence of a catalytic amount of rate-promoting agent selected from acid salts of tertiary amines.

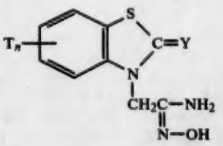
4,323,686

BENZOTHIAZOLEETHANIMIDAMIDES

John J. D'Amico, Olivette, and John T. Marvel, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 68,993, Aug. 23, 1979, Pat. No. 4,283,220. This application Dec. 10, 1980, Ser. No. 214,910
Int. Cl.³ C07D *277/68, 277/70*
U.S. Cl. 548—165 **7 Claims**

1. A compound having the formula



wherein T is halogen or trifluoromethyl, n is 0 or 1 and Y is oxygen or sulfur.

4,323,687

PROCESS FOR THE PREPARATION OF 1,2,4-TRIAZOLIDINE-3,5-DIONE

Rudolf Merten, Leverkusen, and Ludwig Rottmaier, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 208,870

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1979, 2947619

Int. Cl.³ C07D *249/12*

U.S. Cl. 548—264 7 Claims

1. A process for the preparation of 1,2,4-triazolidine-3,5-dione, which comprises suspending hydrazodicarbonamide in at least one organic, water-miscible or water-immiscible solvent and cyclising it at a temperature in the range of from 150° to 280° C. and at a pressure of from 50 mbar to 5 bar with removal of the ammonia split off from the reaction mixture, and isolating the resulting 1,2,4-triazolidine-3,5-dione after crystallization.

4,323,688

BENZIMIDAZOLE-2-CARBOXYLIC ACID AND DERIVATIVES THEREOF

Ernst Habicht, Oberwil; Pier G. Ferrini, and Alfred Sallmann, both of Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,632

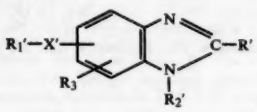
Claims priority, application Hungary, Aug. 1, 1977, CI 1761; Switzerland, Feb. 27, 1978, 2094/78

Int. Cl.³ C07D *235/04*

U.S. Cl. 548—330 5 Claims

1. A benzimidazole-2-derivative of the formula

(Ia)



Ia, in which R′ is carboxyl, hydroxymethyl or lower alkoxycarbonyl having a total of not more than 5 carbon atoms, R_1'-X′ is lower alkyl of 4 carbon atoms and R_2' is lower alkyl having not more than 4 carbon atoms and R_3 is hydrogen or lower alkyl having not more than 4 carbon atoms, or a pharmaceutically usable salt of said compound with salt-forming properties.

3. The compound 5-butyl-2-ethoxymethyl-1,6-dimethyl-benzimidazole or a pharmaceutically acceptable salt thereof.

4,323,689

2-HYDROXYPROPYLIMIDAZOLES, THEIR PREPARATION, AND THEIR USE AS OIL-SOLUBLE CORROSION INHIBITORS

Hans-Henning Vogel, Frankenthal; Rainer Strickler, Heidelberg; Knut Oppenlaender, Ludwigshafen, and Richard Baur, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,959

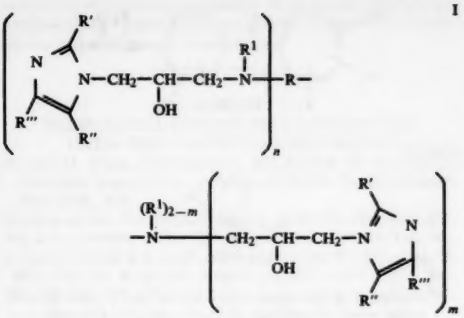
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948884

Int. Cl.³ C07D *403/00*

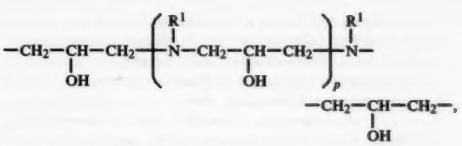
U.S. Cl. 548—336 2 Claims

1. A 2-hydroxypropylimidazole derivative of the formula I

I



where m is 1 or 2 and n is 0 or 1, with the proviso that m+n is 2, R^1 is an aliphatic or where m is 1 or 2 and n is 0 or 1, R^1 is an aliphatic or cycloaliphatic radical of 6 to 21 carbon atoms, R, if n is 0, is an aliphatic, cycloaliphatic, aromatic or araliphatic radical of 6 to 21 carbon atoms and is preferably identical with R^1, or R, if n is 1, is a divalent aliphatic or aromatic radical of 2 to 15 carbon atoms or is



p is 0 or 2, and R′, R″ and R‴ are hydrogen or alkyl of 1 to 4 carbon atoms, and R″ or R‴ may also be nitro.

4,323,690

METHOD OF MAKING SILICATE ESTERS

John F. Montle, St. Louis; Henry J. Markowski, Manchester; Paul D. Lodewyck, St. Louis, and Daniel F. Schneider, III, House Springs, all of Mo., assignors to Carboline Company, St. Louis, Mo.

Filed Apr. 20, 1981, Ser. No. 255,479

Int. Cl.³ C07F *7/04, 7/18*

U.S. Cl. 556—470 11 Claims

1. A process for making tetraalkyl or tetraalkoxyalkyl silicates comprising heating an alkanol or an alkoxyalkanol having from 1 to 6 carbon atoms with finely divided silicon and with an alkali metal carboxylic acid salt, and separating the hydrogen by-product from the reaction mixture.

4,323,691

HYDROXYAMINOMETHYL DERIVATIVES OF BENZOYL DI-SUBSTITUTED α-PHENOXYALKANOYL ESTERS

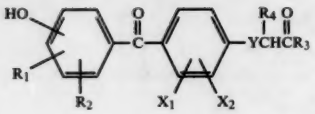
Carroll W. Ours, Zion, and Cheuk M. Lee, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 83,008, Oct. 9, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 212,007

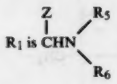
Int. Cl.³ C07C *101/34;* A61K *31/24*

U.S. Cl. 560—36 28 Claims

1. A compound of the formula



wherein



wherein Z is hydrogen or loweralkyl and R_5 and R_6 may be the same or different and are hydrogen, loweralkyl or together are alkylene of 4 or 5 carbon atoms,

R_2 is hydrogen, halo, haloloweralkyl, loweralkyl, loweralkoxy, loweralkylthio or

wherein R_5 and R_6 are as previously defined,

R_3 is hydroxy, alkoxy, branched alkoxy, adamantyloxy, morpholino, amino or amino substituted by loweralkyl or together are alkylene of 4 or 5 carbon atoms,

R_4 is hydrogen or loweralkyl, and

X_1 and X_2 are hydrogen, loweralkyl, halo or when substituted on adjacent carbon atoms of the benzene ring form a 1,3-butadienylene linkage, Y is oxygen or sulfur, and pharmaceutically acceptable salts thereof.

4,323,692

PROCESS FOR PREPARING PHENOXYBENZOIC ACIDS

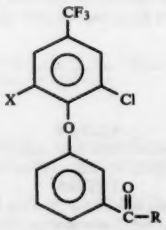
Charles M. Tanger, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 4, 1978, Ser. No. 931,054

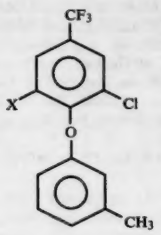
Int. Cl.³ C07C *69/76, 51/265, 153/11, 103/76*

U.S. Cl. 560—65 **7 Claims**

1. A process for the preparation of compounds of the formula



wherein R is ONa, OK, OR^1, SR^1, NR^1R^1 wherein R^1 is hydrogen, alkyl, substituted alkyl or alkenyl, and X is hydrogen or halogen which comprises oxidizing a phenoxytoluene of the formula



wherein X is hydrogen or halogen, in an appropriate protic solvent selected from the group consisting of acetic acid, propionic acid and butyric acid, in the presence of from about 0.001 to about 0.5 moles of a cobalt (II) salt per mole of phenoxytoluene, from about 1 to about 3 equivalents of bromide ion per mole of cobalt (II) salt, from about ½ to about 1 mole of hydrogen peroxide per mole of cobalt (II) salt and a feed rate of from about 0.001 to about 1.0 moles of oxygen per minute, per mole of phenoxytoluene at temperatures from about 70° C. to about 115° C. at about atmospheric pressure optionally followed by esterification, amidation or salt formation.

4,323,693

BENZOIC ACID ESTER

Thomas L. Scala, Jr., West Milford, N.J., assignor to Finetex, Inc., Elmwood Park, N.J.

Continuation-in-part of Ser. No. 252,794, Apr. 13, 1981, which is a continuation-in-part of Ser. No. 74,071, Sep. 14, 1979, Pat. No. 4,275,222, which is a continuation-in-part of Ser. No. 949,630, Oct. 10, 1978, abandoned. This application Apr. 27, 1981, Ser. No. 257,977

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—103 **1 Claim**

1. A benzoic acid ester of isostearyl alcohol.

4,323,694

BENZOIC ACID ESTERS

Thomas L. Scala, Jr., West Milford, N.J., assignor to Finetex, Inc., Elmwood Park, N.J.

Continuation-in-part of Ser. No. 252,794, Apr. 13, 1981, which is a continuation-in-part of Ser. No. 74,071, Sep. 14, 1979, Pat. No. 4,275,222, which is a continuation-in-part of Ser. No. 20,850, Mar. 15, 1979, which is a continuation-in-part of Ser. No. 949,630, Oct. 10, 1978, abandoned. This application Apr. 29, 1981, Ser. No. 258,801

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—103 **4 Claims**

1. A benzoic acid ester of an alcohol, wherein said alcohol is selected from the group consisting of:

(A) at least one C_{2n} branched primary alcohol, wherein n is 5 through 9;

(B) at least one C_{2m+1} branched or linear primary alcohol, wherein m is 4 through 9; and

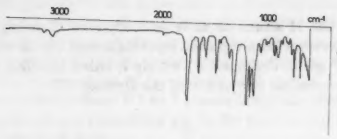
(C) mixtures comprising at least 40% by weight of the members of (A) and/or (B), with one or more linear primary alcohols of even carbon number chain length.

4,323,695

PROCESS FOR MAKING AN ACRYLIC MONOMER

Bertrand Bloch, Paris; Chantal C. Meyer, Voisins le Bretonneux, and Denis Charrier, Antony, all of France, assignors to Office National d'Etudes et de Recherches, Chatillon Sous Bagneux, France

Filed Dec. 11, 1979, Ser. No. 102,389
Claims priority, application France, Dec. 15, 1978, 78 35458
Int. Cl.[3] C07C 67/14
U.S. Cl. 560—145 9 Claims



1. A process for producing phenyl fluoroacrylate by reacting a fluoroacryloyl halide with phenol to produce phenyl fluoroacrylate comprising the steps of:

saponifying the reaction product of formaldehyde and an enolate of an oxalofluoroacetic acid ester having the formula:

$$R—O—CO—C(OM_1)=C(F)\,CO—O—R$$

in which R is an alkyl radical and M_1 is a metal cation, by using a substantially stoichiometric amount of a strong base in aqueous solution, and recovering the salt of fluoroacrylic acid thus obtained;

reacting substantially stoichiometric amounts of said salt with a halogenating agent in the presence of inert solvent with respect to the halogenating agent, and

reacting the fluoroacryloyl halide with phenol.

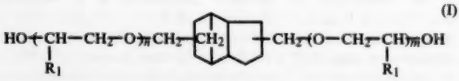
4,323,696

(METH)ACRYLIC ACID ESTERS OF TRICYCLIC DECANEDIOLS CONTAINING ETHER GROUPS

Robert Schmitz-Josten, Cologne, Fed. Rep. of Germany; Manfred Dietrich, New Martinsville, W. Va., and Bruno Bömer, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 1, 1980, Ser. No. 174,332
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931925
Int. Cl.[3] C07C 69/54
U.S. Cl. 560—220 8 Claims

1. Compounds which are acrylic or methacrylic esters of tricyclic decanediols, containing ether groups, of the formula



in which

R_1 represents a hydrogen atom, a methyl group or an ethyl group and

n+m represents an integer from 1 to 10.

4,323,697

PROCESS FOR PREPARING ETHYLIDENE DIACETATE

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Dec. 24, 1980, Ser. No. 219,787
Int. Cl.[3] C07C 67/36, 67/37, 69/16
U.S. Cl. 560—232 4 Claims

1. A process for the preparation of ethylidene diacetate which comprises reacting methyl acetate and/or dimethyl ether under anhydrous conditions with hydrogen and carbon monoxide in the presence of a molybdenum-nickel co-catalyst or a tungsten-nickel co-catalyst, in the presence of an iodide and in the presence as a promoter of an organo-phosphorus compound or an organo-nitrogen compound wherein the phosphorus and nitrogen are trivalent.

4,323,698

RESIN-METAL COMPOUND COMPLEX FOR CATALYZING CHEMICAL REACTIONS

Werner O. Haag, Lawrenceville, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 965,829, Dec. 4, 1978, Pat. No. 4,211,880, which is a division of Ser. No. 858,228, Dec. 7, 1977, Pat. No. 4,145,486, which is a continuation of Ser. No. 501,429, Aug. 29, 1974, Pat. No. 4,111,856, which is a continuation of Ser. No. 306,782, Nov. 15, 1972, which is a continuation-in-part of Ser. No. 860,807, Sep. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 672,010, Oct. 2, 1967, abandoned. This application Jan. 21, 1980, Ser. No. 113,897
Int. Cl.[3] C07C 67/36, 51/12, 5/03, 45/49
U.S. Cl. 560—233 10 Claims

1. In a method of carrying out a metal-compound catalyzed reaction, the improvement comprising employing as a catalyst an insoluble resin-metal coordinative complex compound comprising an insoluble weak base anion exchange resin having amine, phosphine, arsine, stibine, thiol or sulfide Lewis base substituents, said resin being coordinatively, nonionically bonded through said substituent to a metal atom selected from the group consisting of platinum, palladium, rhodium, ruthenium, osmium, iridium, gold, cadmium, titanium, zirconium, hafnium, vanadium, chromium, molybdenum, tungsten, manganese, rhenium, iron, cobalt, nickel, copper, zinc, silver, and mercury.

10. The method of claim 1 wherein said metal-compound catalyzed reaction is a carbon monoxide insertion reaction.

4,323,699

OXIDATION OF SUBSTITUTED AROMATIC COMPOUNDS TO AROMATIC CARBOXYLIC ACIDS

Stephen V. Norval, Guisborough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 26, 1981, Ser. No. 267,421
Claims priority, application United Kingdom, Jun. 10, 1980, 18919/80
Int. Cl.[3] C07C 51/16
U.S. Cl. 562—416 10 Claims

1. In a process for the production of an aromatic carboxylic acid which comprises oxidising by means of molecular oxygen a substituted aromatic compound in the presence of a catalyst comprising a heavy metal compound and/or bromine or a bromine-containing compound, the improvement whereby the reaction is carried out in an essentially aqueous reaction medium and in the presence of iodine or an iodine-containing compound.

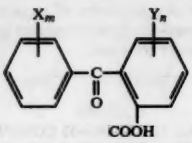
4,323,700

PROCESS FOR PREPARING BENZOPHENONE DERIVATIVES

Mitsuru Kondo; Hiroshi Iwasaki, both of Kawanishi; Kiyoshi Yasui, Mukomotomachi, and Makoto Miyake, Nishinomiya, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Hyogo, Japan

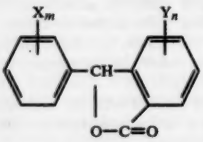
Continuation of Ser. No. 772,124, Feb. 25, 1977, abandoned. This application Sep. 6, 1979, Ser. No. 73,108
Claims priority, application Japan, Mar. 4, 1976, 51-23912
Int. Cl.[3] C07C 59/76
U.S. Cl. 562—460 17 Claims

1. A process for preparing benzophenone derivatives having the general formula


(I)

wherein each of X and Y is a substituent selected from the group consisting of a halogen; a nitro group; an alkyl group; an amino group substituted with two substituents selected from the group consisting of a saturated C_{1-4} alkyl group, an allyl group, a propargyl group, a phenyl group, a tolyl group and a benzyl group; a morpholino group; a pyrimidino group; a pyrrolidino group; and a C_{1-2} alkoxy group, each of m and n is 0 or an integer from 1 to 2, or XM

is a moiety selected from the group consisting of a juloidine moiety or a 1-butyl, 1,2,3,4-tetrahydroquinoline moiety which comprises dissolving a 3-phenylphthalide derivative having the general formula


(II)

wherein X, Y, m and n are the same as described hereinbefore, into an aqueous solution of alkali salt and oxidizing said dispersed 3-phenylphthalide derivative with at least one oxidizing agent, said alkali salt being in at least an equimolar amount with respect to said 3-phenylphthalide derivative.

4,323,701

PROCESS FOR THE PREPARATION OF INDENONECARBOXYLIC ACIDS

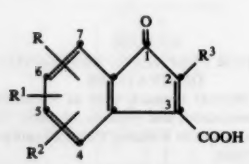
Hans Bosshard, Basel; Hermann Rempfler, Ettingen, and Hans Zweifel, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 114,488, Jan. 23, 1980, abandoned. This application Feb. 9, 1981, Ser. No. 232,763

Int. Cl.[3] **C07C** *59/81, 62/38, 51/08, 69/757*

U.S. Cl. 562—462 **11 Claims**

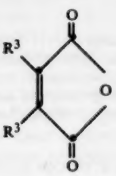
1. A process for the preparation of an indenonecarboxylic acid of the formula I


(I)

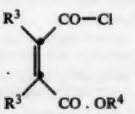
in which R^3 is Cl or Br, and R, R^1 and R^2 are identical or different and R is a n-alkyl radical having 1 to 4 C atoms, or is H, Cl, Br or F, R^1 is a n-alkyl radical having 1 to 4 C atoms, or is H, and R^2 is H or CH_3, or R^1 and R^2 together are the group $—CH_2CH_2CH_2—$, in which latter case the bond to the six-membered ring is via the C atoms in the 5-position and 6-position of the nucleus, which comprises subjecting an aromatic compound of the formula II

(II)

in which the H atoms on at least 2 adjacent C atoms of the nucleus have not been replaced by substituents and in which R, R^1 and R^2 are as defined for formula I, either together with a diahalogenomaleic anhydride of the formula III


(III)

or together with an ester of the formula IV


(IV)

in which formulae R^3 is as defined for formula I and R^4 is in each case a low-molecular aliphatic radical, a cycloaliphatic radical, an aliphatic-aromatic radical or an aromatic radical, in each case in an approximately stoichiometric ratio, to a condensation reaction in the presence of $AlCl_3$ and if desired in the presence of inert fluxes and/or solvents, at temperatures between 40° and 150° C., and hydrolysing the reaction product thus obtained.

4,323,702

PROCESS FOR RECOVERING A CARBOXYLIC ACID

Nariyoshi Kawabata, Osaka; Shinichi Yasuda, Otsu, and Takeshi Yamazaki, Sakai, all of Japan, assignors to Koei Chemical Co., Ltd., Osaka, Japan

Filed Nov. 17, 1980, Ser. No. 207,796

Claims priority, application Japan, Nov. 21, 1979, 54-151416

Int. Cl.[3] **C07C** *51/42, 59/48, 65/10, 53/00*

U.S. Cl. 562—485 **11 Claims**

1. A process for recovering a carboxylic acid, from an aqueous solution thereof which comprises capturing a carboxylic acid by use of a capturing material of which the main component is a polymeric compound having a pyridine skeletal structure and a crosslinked structure, followed by desorbing the captured carboxylic acid by use of a desorbing agent selected from the group consisting of an aliphatic alcohol, an aliphatic ketone and a carboxylic ester.

4,323,703

PROCESS FOR THE OXIDATION OF OLEFINS TO ALDEHYDES AND ACIDS

Robert K. Grasselli, Garfield Heights; Arthur F. Miller, Cleveland, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 676,039, Apr. 12, 1976, abandoned, which is a continuation of Ser. No. 112,782, Feb. 4, 1971, abandoned. This application May 26, 1977, Ser. No. 800,981

Int. Cl.[3] **C07C** *51/25, 45/35*

U.S. Cl. 562—546 **13 Claims**

1. The process for the conversion of an olefin selected from the group consisting of propylene, isobutylene and mixtures thereof, to the corresponding unsaturated aldehydes and unsaturated carboxylic acids, comprising reacting in the vapor phase at a temperature of from about 500° to 900° F. and at a pressure of from about 0.5 to 5 atmospheres said olefin with a molecular oxygen-containing gas in the presence of a catalyst of the empirical formula:

$$A_aB_bC_cFe_dBi_eMo_fO_x$$

wherein A is an alkali metal, B is phosphorus or arsenic or both, and C is at least one element selected from Group II A of the Periodic Classification of elements, and wherein (a) is a number greater than 0 to less than 0.1, (b) is a number from 0 to 3, (c) is a number from 0.1 to 10, (d) and (e) are each a number from 0.1 to 6, (f) is a number from 8 to 16, and (x) is a number determined by the valence requirements of the other elements present.

4,323,704

αACETYLENE AND α-VINYL DERIVATIVES OF AMINO ACIDS

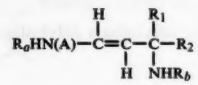
Brian W. Metcalf, Strasbourg; Michel Jung, Illkirch, and Charles Danzin, Strasbourg, all of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Division of Ser. No. 52,035, Jun. 25, 1979, Pat. No. 4,267,374, which is a continuation of Ser. No. 812,115, Jul. 1, 1977, abandoned. This application Jan. 16, 1981, Ser. No. 225,503

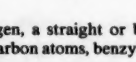
Int. Cl.[3] **C07C** *103/52, 101/28, 103/68, 125/065, 125/073, 129/12*

U.S. Cl. 562—561 **9 Claims**

1. A compound of the Formula

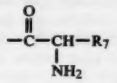


wherein A is methylene, ethylene or ethylidene; R_1 is $-CH{=}CH_2$ or $-C{\equiv}CH$; R_2 is COR wherein R is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, $-NR_4R_5$ wherein each of R_4 and R_5 is hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms, or



wherein R_6 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; Ra is hydrogen,

alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms, and is straight or branched or



wherein R_7 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; and R_b has the same meaning as defined for R_a except R_b is not

and R_a and R_b can be the same or different; with the proviso that when R_a is

A is methylene; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,323,705

PROCESS FOR THE PREPARATION OF N,N'-DIFORMYLHYDRAZINE

Harald Knorr, Gersthofen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

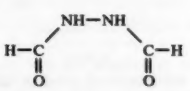
Filed Oct. 22, 1980, Ser. No. 199,456

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943264

Int. Cl.[3] **C07C** *97/16*

U.S. Cl. 564—151 **2 Claims**

1. In a process for the preparation of N,N'-diformylhydrazine of the formula



by reaction of formamide and hydrazine hydrate with splitting off of ammonia, the improvement which comprises mixing first formamide and hydrazine hydrate in a molar ratio of from 2:1 to 2:0.6 at a temperature of from 5° to 25° C., and maintaining this mixture at the same temperature under reduced pressure until splitting-off of ammonia is completed, then raising the temperature to 80°–120° C. and allowing the reaction to continue for 1 to 3 hours also under reduced pressure, and finally distilling off water and unreacted starting material under a pressure reduced still further.

4,323,706

PRODUCTION OF ACETALDEHYDE OXIME

John H. Bonfield, Basking Ridge; Stephen E. Belsky, Parsippany, and Donald Pickens, Mendham, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 880,672, Feb. 23, 1978, abandoned. This application Dec. 18, 1980, Ser. No. 217,938

Int. Cl.[3] **C07C** *131/00*

U.S. Cl. 564—253 **11 Claims**

1. A method for preparing acetaldehyde oxime by oximating acetaldehyde with an aqueous oximation reaction mixture which includes a salt and recovering acetaldehyde oxime from the aqueous oximation reaction mixture, characterized in that the acetaldehyde oxime is recovered by:

first distilling a mixture of acetaldehyde oxime, water and lights including acetaldehyde and ammonia directly from the aqueous oximation reaction mixture under conditions of temperature and pressure at which acetaldehyde oxime, water and lights are volatile, and then distilling lights from said mixture of acetaldehyde oxime, water and lights under conditions of temperature and pressure at which lights are volatile and acetaldehyde oxime is non-volatile to remove the lights and produce a product mixture of acetaldehyde oxime and water relatively free of lights.

4,323,707
ANTIFERTILITY COMPOUNDS

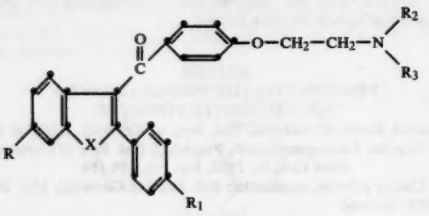
Tulio Suarez, and C. David Jones, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 930,639, Aug. 3, 1978, Pat. No. 4,230,862, which is a continuation of Ser. No. 761,930, Jan. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 724,202, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,991, Oct. 28, 1975, abandoned. This application May 12, 1980, Ser. No. 148,640

Int. Cl.³ C07C *93/06*

U.S. Cl. 564—324 **15 Claims**

1. A compound of the formula



in which X is —CH_2—CH_2— or —CH=CH—; R is hydrogen, hydroxyl, or C_1–C_5 alkoxy; R_1 is hydrogen, hydroxyl, or C_1–C_5 alkoxy; and R_2 and R_3 independently are C_1–C_4 alkyl; and pharmaceutically acceptable non-toxic acid addition salts thereof.

4,323,708
METHOD FOR PREPARING 2,4-DIAMINOLPHENOL OR 2,4-DIAMONOPHENOL DIHYDROCHLORIDE

Alexandr P. Mischenko, Teply Stan, 2 mikroraion, korpus 27, kv. 426; Vladimir M. Gryaznov, Lomonosovsky prospekt, 14, kv. 504, both of Moscow; Igor G. Gakh, ulitsa Shevchenko, 21, kv. 58, Shostka; Iraida L. Parbuzina, Metrostroevskaya ulitsa, 3/14, kv. 44, Moscow; Evgeny M. Savitsky, ulitsa Ulyanova, DNR-3, kv. 13, Moscow; Viktoria P. Polyakova, ulitsa Trofimova, 15, kv. 211, Moscow, and Natalia R. Roshan, Yaroslavskoe shosse, 57, kv. 36, Moscow, all of U.S.S.R.

Filed Apr. 14, 1980, Ser. No. 140,311

Int. Cl.³ C07C *89/00, 85/11*

U.S. Cl. 564—418 **1 Claim**

1. A method for preparing phenol diamino derivatives selected from the group consisting of 2,4-diaminophenol and 2,4-diaminophenol dihydrochloride comprising hydrogenation of 2,4-dinitrophenol on a membrane catalyst made of an alloy consisting of 90 to 98% by mass of palladium and 2 to 10% by mass of a metal selected from the group consisting of rhodium and ruthenium; said hydrogenation of 2,4-dinitrophenol is effected by hydrogen diffusing through said membrane catalyst; the starting 2,4-dinitrophenol is used in a medium of a polar solvent selected from the group consisting of water and a 4–37% aqueous solution of hydrochloric acid at a concentration of 2,4-dinitrophenol in said medium ranging from 2 to 50% by mass; said hydrogenation being conducted at a temperature within the range of from 50° to 150° C. under a pressure of from 1 to 60 atm.

4,323,709
PREPARATION OF POLYMERIC REACTION PRODUCTS OF POLY(ALKOXYALKYLENE)AMINES AND EPIHALOHYDRINS

Gary W. Y. Kwong, Racine, Wis., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 92,386, Nov. 8, 1979, Pat. No. 4,252,746. This application Oct. 15, 1980, Ser. No. 197,306

Int. Cl.³ C07C *85/04, 89/02*

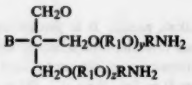
U.S. Cl. 564—476 **6 Claims**

1. The process of making a polymeric reaction product which comprises reacting one molar proportion of a poly(oxyalkylene)amine of the structure A-$(R_1O)_n$-RNH_2, wherein

(a) R and each R_1 are independently selected from the group consisting of alkylene moieties containing from 2 to about 10 carbon atoms;

(b) n is an integer from 2 to about 50;

(c) A is selected from the group consiting of H_2N, alkoxy, where the carbonaceous portion contains from 1 to about 40 carbon atoms, and



wherein B is selected from the group consisting of hydrogen and alkyl containing from 1 to about 10 carbon atoms, and y, z are integers from 1 to about 10;

with about 0.5 to about 2.0 molar proportions of an epihalohydrin selected from the group consisting of epihalohydrin, 1-halo-3,4-epoxybutane, 1-halo-2,3-epoxybutane, 1-halo-4,5-epoxypentane, and 1-halo-3,4-epoxypentane, at a temperature from about 40° C. to about 150° C., thereafter reacting the resultant adduct with an inorganic base at said temperature, and recovering the polymeric reaction product.

4,323,710
PARTIAL ALKYLATION OF POLYHYDROXYBENZOPHENONES

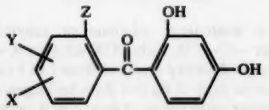
Allan Wexler, Haledon; Paritosh M. Chakrabarti, Cedar Grove, and Michael J. Brown, Randolph, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,026

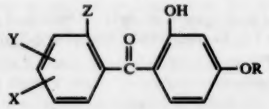
Int. Cl.³ C07C *45/61*

U.S. Cl. 568—315 **7 Claims**

1. The process for alkylating a polyhydroxybenzophenone of the formula:



where Z is hydrogen, alkyl, alkoxy, halogen or hydroxy and where X and Y individually are hydrogen, alkyl, alkoxy or halogen to produce an ortho hydroxy, para alkoxybenzophenone of the formula:



where R is alkyl and Z and X and Y are as defined above; which comprises the steps of:

(a) forming a reaction mixture consisting of said polyhydroxybenzophenone, an alkyl chloride, a metal bromide or

iodide catalyst, a solid acid acceptor, and a non-aqueous solvent consisting of a polyethylene glycol or its mono- or dialkylated derivatives,

(b) heating the reaction mixture to a reaction temperature of about 155° C. and refluxing the mixture whereupon the reaction is effected from two phases only, namely, a solid and liquid solvent phase in which the solvent also functions as a solid-liquid phase transfer catalyst to improve the yield of product and shorten the reaction time,

(c) removing any water of reaction at said reaction temperature,

(d) continuing to reflux for a time sufficient to effect alkylation, and,

(e) recovering the alkylated product.

4,323,711

PROCESS FOR PRODUCING CYCLOHEXENES

Teodor Lukàc, Aesch; Erich Widmer, Münchenstein, and Reinhard Zell, Rodersdorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

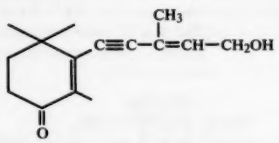
Filed Nov. 10, 1980, Ser. No. 205,410

Claims priority, application Switzerland, Nov. 28, 1979, 10581/79

Int. Cl.³ C07C *45/62, 45/00*

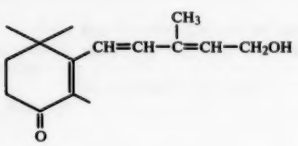
U.S. Cl. 568—347 **5 Claims**

1. A process comprising hydrogenating a compound of the formula:



I

by treating said compound with zinc and a carboxylic acid having from 1 to 3 carbon atoms to produce a compound of the formula



II

4,323,712

ETHERIFICATION OF OLEFINIC HYDROCARBONS

Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 22, 1980, Ser. No. 189,449

Int. Cl.³ C07C *41/05*

U.S. Cl. 568—697 **13 Claims**

1. A process for the etherification of an olefinic hydrocarbon containing from 2 up to about 10 carbon atoms which comprises reacting said olefinic hydrocarbon with an aliphatic alcohol containing from 1 to about 10 carbon atoms in the presence of a catalyst consisting essentially of a metal phthalocyanine sulfonic acid, wherein said metal is selected from the group consisting essentially of cobalt, vanadium, magnesium, titanium, hafnium, tantalum, molybdenum, manganese, iron, nickel, platinum, palladium, copper, silver, zinc and tin at etherification conditions, and recovering the resultant ether.

4,323,713

PREPARATION OF MONO-TERTIARY BUTYLHYDROQUINONE

Dusan J. Engel, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 20, 1980, Ser. No. 208,952

Int. Cl.³ C07C *37/11, 39/08*

U.S. Cl. 568—766 **11 Claims**

1. A process for the preparation of mono-tertiary butylhydroquinone which comprises reacting hydroquinone with an alkylating agent comprising isobutylene or t-butyl alcohol at reaction conditions in the presence of an acidic alkylation catalyst selected from the group consisting essentially of phosphoric acid and fluorosulfonic acid in a reaction medium comprising a mixture of a nonpolar hydrocarbon and an aliphatic ketone selected from the group consisting of acetone, methyl ethyl ketone, 2-pentanone, 3-pentanone, 2-hexanone, 3-hexanone, 2-heptanone, 3-heptanone, 4-heptanone, 2-octanone, 3-octanone, and 4-octanone and recovering the resultant mono-tertiary butylhydroquinone.

4,323,714

ALKYLATION OF HYDROXY-SUBSTITUTED AROMATIC COMPOUNDS

Thomas P. Malloy, Lake Zurich, and Dusan J. Engel, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 20, 1980, Ser. No. 208,953

Int. Cl.³ C07C *37/11, 39/08*

U.S. Cl. 568—766 **8 Claims**

1. A process for the alkylation of a mono- or di-hydroxy-substituted aromatic compound selected from the group consisting of phenol, 1-hydroxynaphthalene, 2-hydroxynaphthalene, anthracene, 2-hydroxyanthracene, 1-hydroxyphenanthrene, 2-hydroxyphenanthrene, 3-hydroxyphenanthrene, 1,2-dihydroxybenzene (catechol), 1,4-dihydroxybenzene (hydroquinone), 1,2-dihydroxynaphthalene, 1,4-dihydroxynaphthalene, 1,5-dihydroxynaphthalene, 1,2-dihydroxyanthracene, and 1,4-dihydroxyanthracene, which comprises treating said mono- or di-hydroxy-substituted aromatic compound with an alkylation agent selected from the group consisting essentially of aliphatic olefins containing from 2 carbon atoms to about 10 carbon atoms in length and alcohols containing from 1 to about 10 carbon atoms in length at a temperature of from about 50° to about 200° C. and a pressure in the range of from about atmospheric pressure to about 100 atmosphere in the presence of a catalyst consisting essentially of a solid perfluorosulfonic acid resin, and recovering the resultant alkylated hydroxy-substituted aromatic compounds.

4,323,715

PREPARATION OF MONO-TERTIARY BUTYLHYDROQUINONE

Dusan J. Engel, Des Plaines, and Thomas P. Malloy, Lake Zurich, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 20, 1980, Ser. No. 208,954

Int. Cl.³ C07C *37/11, 39/08*

U.S. Cl. 568—766 **9 Claims**

1. A process for the preparation of tertiary butylhydroquinone which comprises alkylating hydroquinone with isobutylene or t-butyl alcohol in the presence of an alkylation catalyst comprising an acidic alumina at alkylation conditions in a reaction medium comprising an ether selected from the group consisting of tetrahydrofuran, dioxane, dimethyl ether of diethylene glycol, dimethyl ether of triethylene glycol, diethyl ether of diethylene glycol and diethyl ether of triethylene glycol, and recovering the tertiary butylhydroquinone.

4,323,716

PROCESS AND CATALYST FOR THE PRODUCTION OF DICHLOROETHANE

Roberto Canavesi, Bollate; Ferdinando Ligorati, Usmate, and Giancarlo Aglietti, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation of Ser. No. 617,951, Sep. 29, 1975, abandoned. This application Jan. 21, 1980, Ser. No. 113,553

Claims priority, application Italy, Oct. 4, 1974, 28051 A/74

Int. Cl.[3] C07C *17/02*

U.S. Cl. 570—243 9 Claims

1. An oxychlorination catalyst, active in the production of dichloroethane, from ethylene, hydrogen chloride and oxygen, consisting of supported copper chloride obtained by contacting a granular support with cupric chloride dissolved in a solvent and evaporating said solvent, the said support consisting of alumina in the crystallographic form eta, having a total volume of pores of from 0.3 to 0.5 ml/g and a surface area of from 250 to 400 m^2/g with a least 90% of said volume attributable to pores with a radius of less than 40 A and with at least 90% of said surface area attributable to pores with a radius of less than 30 A.

4,323,717
FURNACE ELECTRODE CLAMPS

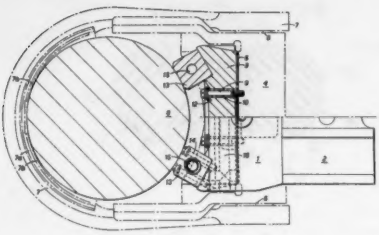
Henry C. Garner, Mexborough, and Lawrence McGee, Sheffield, both of England, assignors to British Steel Corporation, London, England

Filed Jun. 25, 1980, Ser. No. 162,913

Claims priority, application United Kingdom, Feb. 7, 1979, 22881/79

Int. Cl.³ H05B *7/101*

U.S. Cl. 373—101 **9 Claims**



1. A furnace electrode clamp comprising: (a) a metallic body portion; (b) U-shaped band mounted for movement about the body and electrically insulated therefrom and adapted to embrace the electrode; and, (c) an electrode contact piece mounted on the body and against which one side of the electrode is clamped by said band whereby electrical contact is made at that one side only, the contact piece being made from highly conductive material and defining a bore therethrough constituting a water coolant channel.

4,323,718
ARC FURNACE ROOF

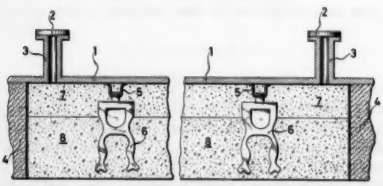
Otto Bühring, Hürth, Fed. Rep. of Germany; Gerardus J. W. Dreessen, Vlissingen; Jacob W. H. Groeneveld, Middelburg, both of Netherlands; Robert Queck, Hürth; Heinrich Thome, Kerpen-Türnich, both of Fed. Rep. of Germany, and Gerrit J. Willemsen, Middelburg, Netherlands, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 17, 1980, Ser. No. 160,167

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925395

Int. Cl.³ F27D *1/02, 1/10*

U.S. Cl. 373—73 **10 Claims**



1. A roof for an electrical reduction furnace comprising a metal cover connectible by bolting to a furnace shell, a first layer of insulating concrete on the inward surface of the metal cover and a second layer applied in effective contact with the inward surface of the first layer, shackle hooks attached to the cover inward surfaces and having anchor bolts hooked thereon, said hooks and bolts being embedded within said first and second layers,

characterized by a temperature gradient being producible in the roof positioned on the furnace during furnace operation, and in the absence of a coolant within the cover, of not more than 100° C. at the shell from a temperature of at least 600° C. in the furnace,

said layers having been prepared by flowing onto the inward cover surface a hydraulically setting composition of 6 to 10 weight % Al_2O_3, 32 to 38 weight % SiO_2, 15 to 20 weight % MgO, 30 to 35 weight % CaO, and 40 to 200 weight % mixing water and applying the composition to the hooks, and setting the hydraulic setting composition to form said first layer in the cover and around the hooks in said first layer,

and applying by flowing onto said first layer and said hooks a second layer of a hydraulically setting composition of 50 to 85 weight % Al_2O_3, 5 to 8 weight % SiO_2, and 10 to 12 weight % mixing water and heating the second composition to set said composition to form said second layer and embed said hooks within said second layer.

4,323,719
INTEGRATED SOLAR CELLS AND SHUNTING DIODES

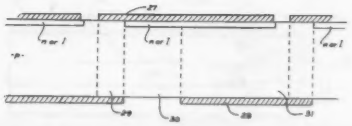
Martin A. Green, Bondi, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Aug. 22, 1980, Ser. No. 181,374

Claims priority, application Australia, Aug. 23, 1979, PE0167

Int. Cl.³ H01L *31/06, 31/18*

U.S. Cl. 136—249 **6 Claims**



1. A solar cell with integral shunting diode, comprising a wafer of semiconductor substrate material having top and bottom metal contact layers having at least some contact with said substrate either directly or indirectly through an intermediate layer of different dopant type or an insulating layer, wherein said layer is nominally divided into three contiguous regions including a shunting or bypass diode region and a main cell region separated by an intermediate isolation region, wherein

said main cell region comprises a portion of the substrate having top and bottom metal contacts, one of which is either directly or indirectly in contact with said substrate and the other of which is separated from said substrate by means of an intermediate layer of different dopant type or an insulating layer,

said isolation region comprises a portion of the substrate which is separated from each of said top and bottom metal contacts by an intermediate layer of diffent dopant type or an insulating layer, and

said bypass diode region comprises a portion of the substrate having top and bottom metal contacts, one of which is either directly or indirecty in contact with said substrate and the other of which is separated from said substrate by means of an intermediate layer of different dopant type or an insulating layer, and wherein said bypass diode is in electrical communication with said main cell by means of a narrow conductive path joining said bypass diode with said main cell.

3. An integrated array of a plurality of solar cells on a single sheet of semiconductor substrate material, comprising a continuous sheet of said substrate having top and bottom metal contact layers having contact with said substrate at spaced intervals, either directly or indirectly through an intermediate layer of different dopant type or an insulating layer, wherein each said cell is nominally divided into three contiguous regions including a main cell region and a shorting or series interconnection region separated by an intermediate isolation region, wherein

said main cell region comprises a portion of the substrate having top and bottom metal contacts with the intermediate

layer of different dopant type or insulating layer separating one of said metal contacts from said substrate, and said main cell region is contiguous with the shorting region of the next adjacent cell,

said isolation region, adjacent said main cell region, comprises a portion of the substrate having only one metal contact and an underlying layer of different dopant type or an insulating layer, both of which are contiguous with the corresponding metal contact and intermediate layer of different dopant type or insulating layer in said main cell region, and

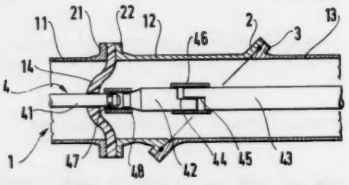
said shorting or series interconnection region comprises a portion of the substrate in contact with both top and bottom metal contacts, one of which metal contacts is also in contact with the main cell region of the next adjacent cell.

4,323,720

SET OF BARS FOR A HIGH-TENSION UNIT

Lucien Orgeret, Lyons, France, assignor to Societe Anonyme dite: Delle-Alsthom, Villeurbanne, France

Filed Apr. 16, 1980, Ser. No. 140,922
Claims priority, application France, Apr. 23, 1979, 79 10223
Int. Cl.³ H02G *5/06, 15/24*
U.S. Cl. 174—21 JS **6 Claims**



1. A metal-clad high-tension unit containing an insulating gas, cladding formed by a casing of cylindrical casing lengths disposed in longitudinal alignment, bars within said casing lengths, a dismantleable intermediate connection casing length interposed between said lengths of casing and having on at least one of its ends a connection flange disposed in a plane which is inclined with respect to the longitudinal axis of the casing and which is aligned with a connection flange of the adjacent length, an intermediate length of bar being disposed inside said connection casing length, the ends of said intermediate length of bar including joining components which are detachably connected to the ends of the bars of the adjacent lengths of casing and said joining components being joined at the plane of contact between the flanges of the casing lengths; whereby, said intermediate connection casing length may be laterally removed without dismantling of the cylindrical casing length or the bars within said casing length.

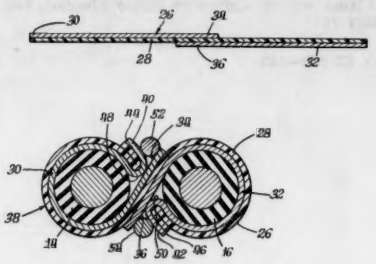
4,323,721

ELECTRIC CABLES WITH IMPROVED SHIELDING MEMBER

John W. Kincaid, Batavia, and Robert E. Ward, Aurora, both of Ill., assignors to Belden Corporation, Geneva, Ill.

Filed Feb. 8, 1980, Ser. No. 119,866
Int. Cl.³ H01B *11/06, 9/02*
U.S. Cl. 174—36 **13 Claims**

1. A shielding member helically wound about and shielding at least two insulated electrical conductors, said helically wound shielding member comprising: an elongated ribbon of insulating material having two opposite sides and two parallel edges; and a pair of elongated metallic foil strips arranged in a parallel relationship with the ribbon, each strip having two opposite sides and two parallel edges, with a respective side of each strip bonded to a respective one of the opposite sides of the ribbon, one of the edges of one of the foil strips being substantially coterminus with one edge of the elongated ribbon, and one of the edges of the other of the foil strips being substantially coterminus with the other edge of the elongated ribbon, the width of each of the foil strips being approximately one half the width of the ribbon, and each of the other edges of



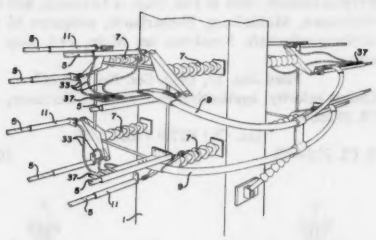
the foil strips slightly overlapping one another, said ribbon being helically wound about said insulated electrical conductors with each of said foil strips surrounding and forming a shielding envelope about said insulated electrical conductors.

4,323,722

OVERHEAD ELECTRIC POWER TRANSMISSION LINE JUMPERING SYSTEM FOR BUNDLES OF FIVE OR MORE SUBCONDUCTORS

Paul F. Winkelman, Beaverton, Oreg., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 24, 1980, Ser. No. 190,307
Int. Cl.³ H02G *7/00*
U.S. Cl. 174—43 **12 Claims**



1. An overhead electric power transmisssion line jumpering system for interconnecting two transmission line conductor bundles which terminate at and are insulatively attached to a common supporting structure, each of said transmission line conductor bundles being generally a cylindrical array of at least five parallel spaced apart elongated electrical transmission line subconductors operable at the same voltage level at any instant of time with terminal ends generally disposed in a common circular plane adjacent to said supporting structure, said system comprising:

a. at least one jumper bus located within each of said bundles and attached to one of said transmission line subconductors adjacent its terminal end;

b. internal jumper conductors located within each of said bundles, one of which is connected from each of said remaining transmission line subconductors adjacent its terminal end directly to one of said jumper buses; and

c. at least one external jumper conductor connected from

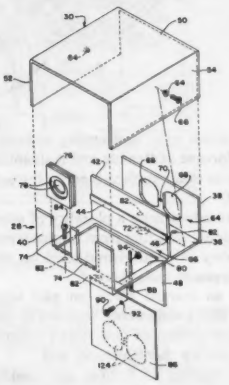
said jumper bus in one of said bundles and extending outside of said bundle to said jumper bus of said other bundle to provide current flow between the said two transmission line conductor bundles.

4,323,723

SURFACE MOUNTED OUTLET UNIT

Frank W. Fork, Allison Park, and Charles J. Kelly, Pittsburgh, both of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Apr. 4, 1980, Ser. No. 137,545
Int. Cl.³ H02G *3/10*
U.S. Cl. 174—48 **11 Claims**



1. A dual service outlet unit comprising;
a base member comprising a segment of a first metal extrusion having a generally U-shaped profile, said base member including a bottom wall, and formed integrally therewith upstanding opposite end walls and an upstanding partition intermediate of said end walls;
a cover member comprising a segment of a second metal extrusion having an inverted generally U-shaped profile, said cover member including a top wall and depending opposite sidewalls;
said cover member straddling said base member with said opposite sidewalls thereof confronting opposite end edges of said end walls and said bottom wall, and said partition extending from said bottom wall to said top wall thereby to define segregated compartments; and
securing means securing said cover member to said base member.

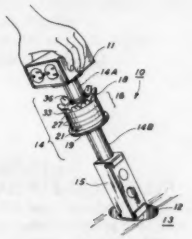
4,323,724

UNITARY INSERTABLE SELF-ANCHORING POKE-THRU WIRING DEVICE

William P. Shine, 3989 Park Ave., Fairfield, Conn. 06430

Filed May 1, 1980, Ser. No. 145,715
Int. Cl.³ H02G *3/22*
U.S. Cl. 174—48 **6 Claims**

1. A unitary insertable self-anchoring poke-thru wiring device for self-captivating anchored insertion in a standard concrete slab floor aperture, providing electrical communication wiring connections or plug-in receptacle power outlets in occupied spaces above the slab floor within a building comprising
a tombstone outlet box whose minimum lateral dimension exceeds the maximum lateral dimension of the standard aperture, whereby a bottom face of the outlet box is dimensioned to overlie and conceal the standard aperture opening into an overlying occupied space, and the outlet box having electrical conductors extending downward therefrom,
hollow elongated conduit means enclosing the extending electrical conductors, and having a first end joined to the bottom face of the outlet box and extending therefrom to a second end, the conduit means having a maximum lateral dimension substantially less than the minimum lateral dimension of the standard floor slab aperture, thus adapting the conduit means for insertion downward through the aperture,
a narrow elongated junction box anchored to the second end of the conduit means, enclosing and presenting the electrical conductors for subsequent connections thereto, and having its maximum lateral dimension substantially less than the minimum lateral dimension of the standard floor slab aperture, whereby the junction box is dimensioned to pass lengthwise through the aperture,



fire-retardant means centrally anchored to the hollow conduit means for positioning inside the aperture,
a conically-dished resilient spring washer encircling the hollow conduit means adjacent to the fire retardant means and having its conical surface concavely diverging toward the outlet box face, with its periphery notched and dimensioned for wedging engagement in the standard aperture,
and means anchoring the spring washer to prevent its displacement relative to the hollow conduit,
whereby the poke-thru wiring device is adapted for unitary insertion from the occupied space into the standard aperture, wherein the resilient spring washer wedgingly engages the internal wall of the standard aperture retaining the wiring device captively installed therein, with the fire-retardant means spanning the standard aperture near its lower end, while the narrow elongated junction box depends therebeneath.

4,323,725

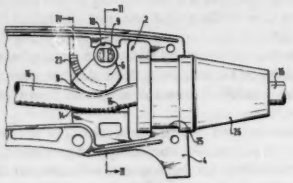
STRAIN RELIEF DEVICE FOR AN ELECTRICAL SUPPLY LINE

Thomas Müller, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,103
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928931
Int. Cl.³ H01R *13/585;* H02G *3/18*
U.S. Cl. 174—65 R **13 Claims**

1. A strain relief device for an electrical supply line in an electrical instrument, particularly a power tool, which has a housing and an opening in the housing to admit the supply line, comprising a clamping member mounted for pivoting about a pivot axis relative to said housing and having a first clamping surface and a pivoting eye; a second clamping surface on said housing, wherein the supply line is adapted to be located between said first and second clamping surfaces, said clamping member being operative to apply a clamping force to said supply line when a strain force is applied to said supply line in the direction outwardly of the housing; and a locking mechanism operative to prevent motion of said supply line in response to a pushing force applied thereto in the direction

inwardly of said housing, said locking mechanism comprising first teeth arranged on said housing so as to form a part of the



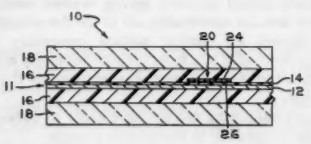
same and located concentrically relative to said pivot axis of said clamping member, and at least one second teeth attached to said clamping member and engageable with said first teeth.

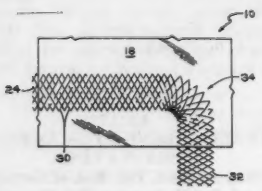
4,323,726

ELECTRICAL BUS BAR ASSEMBLY

Russell C. Criss, Pittsburgh, and Edward J. Stofka, Sarver, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 24, 1980, Ser. No. 171,780
Int. Cl.³ N05K 1/00; N05B 3/06
U.S. Cl. 174—68.5 11 Claims





1. A bus bar assembly for electrically connecting a source of electrical potential to an electroconductive pattern on a nonelectroconductive substrate at a plurality of points, comprising:

at least one elongated metallic current carrying member positioned adjacent said pattern at said plurality of points; and

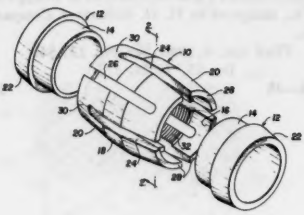
an electroconductive layer between and in contact with adjacent surfaces of said current carrying member and said electroconductive pattern to maintain same in spaced relation, said layer conforming to the surface configurations of both the contacted adjacent surfaces of said member and said pattern to minimize localized high current densities therebetween and having a volume resistivity less than about 10^{-2} ohm-cm., wherein said layer comprises a mixture of finely divided metallic electroconductive particles bound together by fused metal alloy particles substantially free of non-metallic components.

4,323,727

CABLE STRAIN RELIEF AND SEALING APPARATUS

Arthur H. Berg, Fabius, N.Y., assignor to Crouse-Hinds Company, Syracuse, N.Y.

Filed Oct. 21, 1980, Ser. No. 199,342
Int. Cl.³ H02G 3/22; F16J 15/10; H01R 13/58
U.S. Cl. 174—135 11 Claims



1. Cable strain relief and sealing apparatus, comprising:

a sleeve formed of flexible and resilient material, said sleeve having an outer surface tapered inwardly toward one end thereof,

said sleeve comprising a plurality of substantially axial slots alternately extending from opposite ends thereof to define a plurality of cantilevered sections alternately extending from opposite ends thereof,

whereby an inward force on said tapered outer surface causes said cantilevered sections to flex inwardly so that the inner surface of said sleeve constricts to grip a cable when passing therethrough, and

a sealing bushing of flexible and resilient material mating with one end of said sleeve,

said one end of said sleeve having an annular recessed portion, and said bushing having an annular flange portion that is slidably received within said recessed portion.

4,323,728

CONVERSION CIRCUIT ARRANGEMENT AND METHOD FOR SWITCHING DIGITAL ENCODED SIGNALS

Ola Bergman, Munich; Rolf Hagen, Unterhaching; Juergen Harenberg, Munich, and Herbert Steiner, Gelting, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 129,397
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912649
Int. Cl.³ H04N 1/32; G06F 3/14; H04Q 3/54
U.S. Cl. 178—3 10 Claims

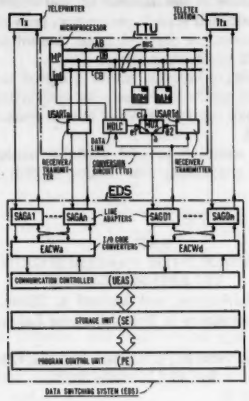
1. A conversion circuit arrangement for establishing bidirectional communication links between different types of data terminals operating with distinctive interfaces with respect to data transmission procedures including signalling, data format and data rate, said circuit arrangement adapted for use with an electronic data switching system capable of controlling data exchange only between data terminals of the same type and including a plurality of sets of line adapters, each set forming connection units associated with just one type of data terminal, said conversion circuit arrangement comprising:

(a) at least two interface circuits each having an external input and output, a first internal input and output and a first control terminal, each including input/output converting networks connected to said internal and external inputs and outputs, and each adapted to be connected to a respective line adapter of a different set of line adapters;

(b) a storage unit adapted for intermediately storing complete messages of transmitting data terminals and having a second internal input and output and a second control terminal, said first and second internal inputs and outputs

being connected in parallel to said second internal output and input, respectively; and

(c) a control means for controlling the buffering of messages in said storage unit such that a message received by one interface circuit in accordance with the data transmission procedure associated with the transmitting data terminal is intermediately buffered and is read out across the other



interface circuit using the different data transmission procedure of the receiving data terminal, said control means having a third control terminal being connected to said first and second control terminals, wherein said conversion circuit arrangement simulates, with respect to said electronic data switching system, a different type of data terminal by means of each interface circuit and allows of inter-connecting different sets of line adapters.

4,323,729
CIRCUIT ARRANGEMENT FOR THE CONTROL OF A CRYPTO OPERATION IN THE CASE OF PROCEDURE-CONTROLLED SEMI-DUPLEX DATA TRANSMISSION SYSTEMS

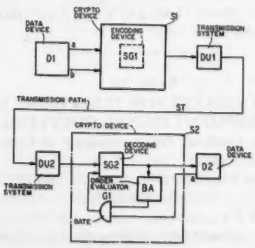
Joerg Westermayer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 19, 1976, Ser. No. 659,968

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1975, 2507803

Int. Cl.³ H04L *9/00*

U.S. Cl. 178—22.01 **1 Claim**



1. In a procedure-controlled semi-duplex data transmission system for crypto operation in which data are transmitted from a first station with a first data device and a first crypto device via a transmission path to a second station having a second crypto device, which includes a decoding device, and a second data device, in which a change of transmission direction is signaled with an order word from the first crypto device to the second crypto device and is evaluated by an order evaluator, whereby the second data device emits a control signal to prepare the second crypto device for transmission when an end signal is received from the first data device, and in which data words inadvertently simulate change of direction order words, the improvement comprising:

gating means having an input connected to the output of the order evaluator and an input connected to the output of the second data device and an output connected to the decoder to stop operation of the decoder in response to an order word in conjunction with an end signal.

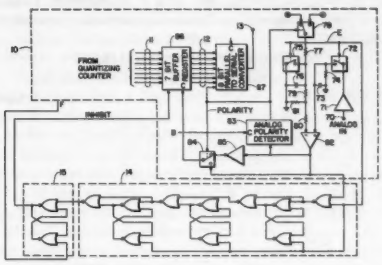
4,323,730
IDLE CHANNEL NOISE SUPPRESSOR FOR SPEECH ENCODERS

Anthony K. D. Brown, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 13, 1979, Ser. No. 48,144

Int. Cl.³ H03K *13/01, 13/20*

U.S. Cl. 179—1 P **4 Claims**



1. In a circuit for encoding analog signals into pulse code modulation samples, the encoding circuit comprising an analog comparator circuit responsive to an analog signal and to a reference signal to provide a first signal, a method for recognizing an idle channel during a sampling period, comprising the steps of: counting at least two, and not more than thirty two, zero-level traversals by the signal at the output of the analog comparator circuit during a single sampling period, and storing in a register means a signal indicating the presence of said traversals whereby the encoding circuit is caused to output a pulse code modulation word corresponding to a zero amplitude analog signal.

4,323,731
VARIABLE-ANGLE, MULTIPLE CHANNEL AMPLITUDE MODULATION SYSTEM

David L. Hershberger, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 970,652, Dec. 18, 1978, Pat. No. 4,225,751. This application Dec. 11, 1979, Ser. No. 102,633

Int. Cl.³ H04H *5/00*

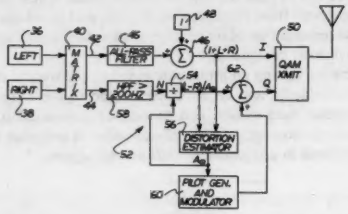
U.S. Cl. 179—1 GS **35 Claims**

1. A modulator comprising:

modulator means for providing a composite modulated signal having a subsonically varying quiescent carrier component, and

adaptor means for separating said composite modulated signal into AF and RF components for application to AF and RF inputs of an AM transmitter, said adapter means including means responsive to said composite modulated signal to provide an envelope signal which varies as the envelope of said composite modulated signal, and means for subsonically

adjusting the gain of said envelope signal so that its DC component remains substantially fixed, thereby reducing



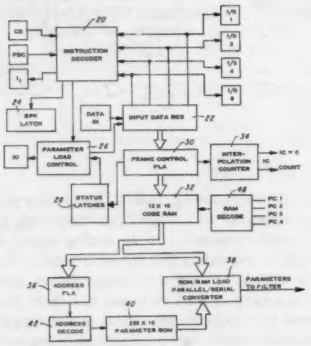
harmonic distortion resulting from AC coupling of said envelope signal into said AF input of said AM transmitter.

4,323,732

SPEECH SYNTHESIS SYSTEM WITH ALTERNATIVE CODED OR UNCODED PARAMETER FORMATS

Richard H. Wiggins, Dallas, and Alva E. Henderson, Lubbock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 4, 1980, Ser. No. 118,367
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SM **6 Claims**



1. A speech synthesis system comprising:

memory means for storing digital speech data as a plurality of digital speech values including digital speech values representative of digital filter coefficients for defining speech parameters in a coded or uncoded format;

digital filter speech synthesizer means operatively associated with said memory means for converting uncoded speech data corresponding to digital speech values representative of digital filter coefficients from said memory means into digital speech signals representative of human speech;

memory load input means having an output coupled to said digital filter speech synthesizer means and having first and second inputs operatively associated with said memory means for alternatively receiving coded or uncoded speech parameters, the first input of said memory load input means being effective to receive uncoded speech parameters from said memory means for input to said digital filter speech synthesizer means;

decoding means operatively interposed between said memory means and the second input of said memory load input means and effective to receive coded speech parameters when enabled for decoding said coded speech parameters, the output of said decoding means being connected to the second input of said memory load input means for providing decoded speech parameters to said memory load input means for input to said digital filter speech synthesizer means;

said decoding means being responsive to a control signal indicative of coded speech parameters being provided from said memory means for receiving said coded speech parameters for decoding prior to reception by said memory load input means, and said memory load input means being effective in the absence of said control signal for directing uncoded speech parameters provided from said memory means via the first input thereof to said digital filter speech synthesizer means;

digital-to-analog converter means coupled to said digital filter speech synthesizer means for converting said digital speech signals representative of human speech into analog signals; and

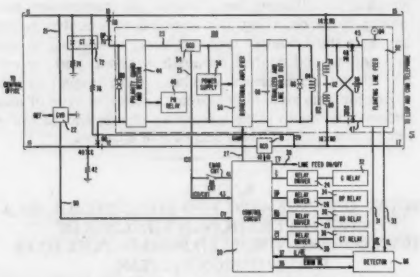
audio means coupled to said digital-to-analog converter means for converting said analog signals into audible sounds.

4,323,733

RANGE EXTENDER WITH VARIABLE GAIN FOR COIN TELEPHONE LOOPS

Henry W. Ott, Livingston, and Bernard A. Tilson, Parsippany, both of N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Nov. 28, 1980, Ser. No. 211,425
Int. Cl.³ H04M *17/02*
U.S. Cl. 179—6.3 R **11 Claims**



1. A method of controlling a coin telephone from a central office over a coin subscriber loop

characterized by the steps of

detecting the flow of current through a single conductor in said coin subscriber loop,

detecting the absence of coin control signal voltages, and

in response to said current and voltage detection, inserting an amplifier circuit (100) and a line feed circuit (52) into said coin subscriber loop.

4,323,734

INTERFACE CIRCUIT FOR TELEPHONE LINE TO EQUIPMENT SIGNAL COUPLING

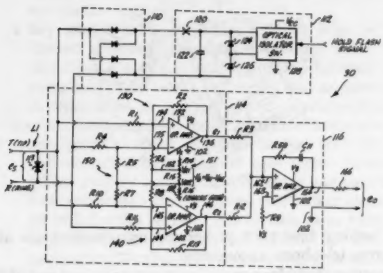
Gene A. Kimzey, Graham, Wash., assignor to Crest Industries, Inc., Puyallup, Wash.

Filed May 15, 1980, Ser. No. 150,199
Int. Cl.³ H04Q *5/20*
U.S. Cl. 179—18 FA **17 Claims**

1. An interface circuit for coupling the tip and ring conductors of a telephone line to a signal utilizing means that is responsive to line voltage supervisory and information signals, including line voltage polarity reversals, comprising:

first and second terminals, said first terminal adapted to be connected to the tip conductor and said second terminal adapted to be connected to the ring conductor such that the line voltage across the tip and ring conductors will be applied to said first and second terminals;

first and second voltage comparator circuit means each being formed by an operational amplifier having an inverting input and a noninverting input and an output, said inputs of said first and second comparator circuit means connected to said first and second terminals in parallel and in an opposite phase relationship such that said first comparator circuit means is effective to respond to changes in the magnitude of the line voltage when it has a relative



reversed polarity, and said second comparator circuit means is effective to respond to changes in the magnitude of the line voltage when it has a normal non-reversed polarity; and

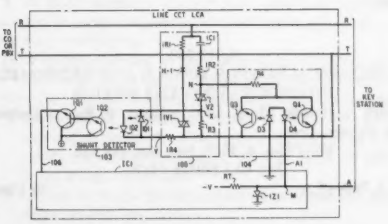
signal combining circuit means connected to said outputs of said first and second comparator circuit means for producing a combined output signal for receipt by the signal utilizing means.

4,323,735

KEY TELEPHONE LINE SHUNT DETECTOR CIRCUIT

Gerry C. Balzer, Freehold, and Alan M. Gordon, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Sep. 26, 1980, Ser. No. 191,143
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—99 LC **13 Claims**



1. A line circuit for use in a key system for detecting and controlling the operational states of a communication pair extending between a switching machine and at least one telephone station, said line circuit comprising

a shunt detector means (**103, 105**) for detecting voltage changes indicative of the operational state of said communication pair

characterized in that

said shunt detector means further includes

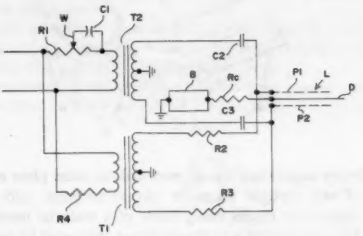
a switchable current shunt (**104**) for changing the sensitivity of said shunt detector means in response to a change in an operational mode of said telephone station.

4,323,736

STEP-UP CIRCUIT FOR DRIVING FULL-RANGE-ELEMENT ELECTROSTATIC LOUDSPEAKERS

James C. Strickland, 3101 SW. First Ter., Fort Lauderdale, Fla. 33315

Filed Aug. 11, 1980, Ser. No. 176,668
Int. Cl.³ H04R *3/06*
U.S. Cl. 179—111 R **9 Claims**



1. An audio step-up circuit for driving full-range-element electrostatic loudspeakers of the type having a flat conductive diaphragm suspended in spaced, parallel relation between a pair of opposed, acoustically transparent stator plates comprising, in combination, a first audio signal voltage step-up transformer for signal voltage step-up at lower audio frequencies of the 30 Hz to 20 kHz audio frequency band, a second audio signal voltage step-up transformer of substantially lesser turns ratio as compared with said first transformer for signal voltage step-up at higher audio frequencies of said 30 Hz to 20 kHz audio frequency band, means for connecting the primary winding of said second transformer to a low voltage, low impedance audio signal source, said connecting means including an adjustable series-parallel RC network in series with said primary winding of said second audio transformer, the secondary windings of said transformers each being center-tapped with the center-taps returned electrically to a common low potential "ground" return for push-pull output operation, a capacitor connected in series with each of the secondary winding terminal leads of said second transformer for capacitive coupling to the stator plates of an electrostatic loudspeaker and a resistive element connected in series with each of the secondary winding terminal leads of said first transformer for resistance coupling to the stator plates of the electrostatic loudspeaker, whereby the output circuits of said first and second transformers will be in parallel-bilateral interconnection for cooperatively feeding the stator plates of the electrostatic loudspeaker, and means for supplying a substantially constant high voltage electrostatic charge to the conductive diaphragm of the electrostatic loudspeaker.

4,323,737

DRIVER UNIT FOR PLANAR DIAPHRAGM TYPE LOUDSPEAKER

Kunihiko Shimada, and Yukio Tsuchiya, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,398
Claims priority, application Japan, Jun. 30, 1979, 54-90266; Jun. 30, 1979, 54-90272
Int. Cl.³ H04R *9/02, 9/04, 9/06*
U.S. Cl. 179—115.5 R **4 Claims**

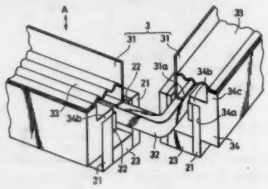
1. A driver unit for a square planar diaphragm type loudspeaker system comprising:

square magnetic circuit means comprising a plurality of straight magnetic circuit sections positioned along corresponding sides of side square planar diaphragm, each of said straight magnetic circuit sections including a pair of parallel plate members, at least one magnet disposed on

one end of an inner wall of each said plate member, said magnets facing one another to form an air gap, and a yoke member joining the other ends of said plate members;

a voice coil bobbin attached along one edge thereof to said square planar diaphragm;

a voice coil attached to the other edge of said voice coil bobbin and disposed in said air gap;



damper supporting means mounted on outer plate members of said straight magnetic circuit sections, said damper supporting means being made of a material having high heat-conductivity to transmit heat generated by said voice coil; and

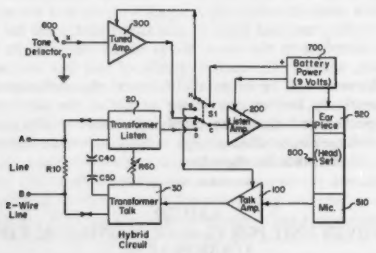
damper means having one edge coupled to said voice coil bobbin for suspending said voice coil bobbin and the other edge thereof supported by said damper supporting means.

4,323,738

PORTABLE TELEPHONE LINE TEST SET

Llewellyn S. Merrick, Wilbraham, Mass., assignor to Oros Corporation, Nutley, N.J.

Filed Apr. 10, 1980, Ser. No. 138,825
Int. Cl.³ H04M 5/00; H04B 3/46
U.S. Cl. 179—175.1 R **2 Claims**



1. A portable two wire line test set comprising:

(a) power supply means for providing electrical energy;

(b) hybrid circuit means for connecting to a telephone line;

(c) first amplifier means connected to said power supply means and to said hybrid circuit means for receiving and amplifying voice signals;

(d) second amplifier means connectable to said power supply means and to said hybrid circuit means for amplifying and transmitting voice signals;

(e) transducer means connected to said first amplifier means for converting said voice signals into audible sounds; and

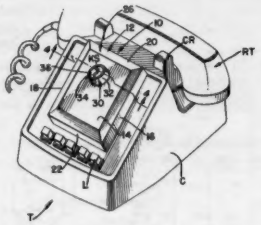
(f) transducer means connected to said second amplifier means for converting audible sound into voice signals.

4,323,739

TELEPHONE LOCKING DEVICE

Louis Flax, Moonachie, and Vincent Brzezinski, Wyckoff, both of N.J., assignors to Televault, Inc., New York, N.Y.

Filed Jun. 14, 1979, Ser. No. 47,307
Int. Cl.³ H04M 1/66
U.S. Cl. 179—189 D **17 Claims**



1. A locking device for preventing unauthorized use of a push-button telephone, comprising:

a protective shield for preventing access to at least one of the dial push-buttons on a dial push-button telephone, said shield including a front surface, a rear surface, sides and ends and having a dial push-button receiving chamber defined in said rear surface for accommodating therein the at least one dial push-button, said chamber being located in said shield rear surface so that access to the interior of said chamber is only possible from said shield rear surface so that said shield prevents access to the at least one dial push-button when said shield is in position on a telephone; and

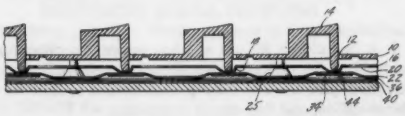
shield mounting means for detachably mounting said shield on a telephone, said mounting means including locking means for locking said shield on the telephone, said shield mounting means including a dial push-button grasping means attached to said locking means and grasping the at least one dial push-button to hold said shield in a dial push-button covering position on the telephone, said locking means including grasping means operating means mounted on said locking means for moving said grasping means into a dial push-button grasping position to mount said shield on a telephone with the at least one dial push-button accommodated in said dial push-button receiving chamber to control access to the at least one dial push-button.

4,323,740

KEYBOARD ACTUATOR DEVICE AND KEYBOARD INCORPORATING THE DEVICE

Frederick A. Balash, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Feb. 4, 1980, Ser. No. 118,513
Int. Cl.³ H01H 13/70
U.S. Cl. 200—5 A **10 Claims**



1. A switch assembly including:

a first circuit layer having a first electrical circuit element on at least one surface thereof, said first circuit layer defining a first plane;

a second circuit layer having a second electrical circuit element on at least one surface thereof, said second circuit layer defining a second plane, said second circuit layer

being positioned relative to said first circuit layer so that said second element is facing but normally out of contact with said first circuit element and said first and second planes are substantially parallel to one another;

a tactile protrusion formed in said second circuit layer, said tactile protrusion projecting out of said first plane and away from said first circuit layer, said tactile protrusion supporting at least a portion of said second electrical circuit element for selective contact with said first electrical circuit element;

a key spaced from said second circuit layer on the side thereof removed from said first circuit layer, said key including a movable actuator bar positioned to cause actuation of said tactile protrusion, said actuator bar being in registration with at least a part of said protrusion; and

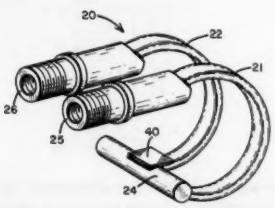
a striker element positioned between said key and said tactile protrusion to effect electrical contact between said first and second circuit elements with tactile feedback, said striker element being generally planar and parallel to said first and second circuit layers, said striker element being provided with a recess which extends away from said key, said recess receiving said key actuator bar and having a geometrical configuration which will transmit an actuating force from said key to the protrusion.

4,323,741

MECHANICAL DEFLECTION APPARATUS FOR SENSING FLUID PRESSURE

Duane D. Krohn, Westminister, Colo., assignor to Graco, Inc., Minneapolis, Minn.

Filed May 27, 1980, Ser. No. 153,443
Int. Cl.³ H01H *35/40*
U.S. Cl. 200—81.9 R **9 Claims**



1. A fluid pressure sensing and switching apparatus for insertion in series fluid flow relationship in a pressurized fluid flow line, comprising

(a) a housing having an inlet and outlet for respective connection in series flow relation to said fluid flow line;

(b) a pair of curved tubes in generally parallel alignment, one end of one of said tubes coupled to said housing inlet and one end of the other of said tubes coupled to said housing outlet, the respective other ends of each of said tubes being freely suspended;

(c) a flow through manifold coupled between the respective other ends of said tubes;

(d) a bracket attached to said housing, said bracket having an L-shaped member with a free end proximate said manifold; and

(e) a switch mounted on said bracket, said switch having an actuator in close proximity to said manifold.

4,323,742

HIGH PRESSURE DIFFERENTIAL SWITCH DEVICE

Wayne A. Priest, Kansas City, Kans., assignor to SOR, Inc., Olathe, Kans.

Filed Jan. 4, 1980, Ser. No. 109,451
Int. Cl.³ H01H *35/38*
U.S. Cl. 200—82 C **12 Claims**

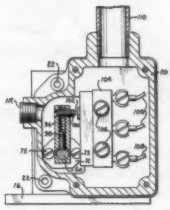
1. A switch device for detecting when the pressure differential between high and low pressures exceeds a preselected level, said switch device comprising:

a housing having high and low pressure ports adapted to receive the respective high and low pressures, said housing presenting a piston chamber therein between said ports;

a piston in said piston chamber having opposed faces exposed to the respective high and low pressure ports to urge the piston toward the low pressure port under the influence of the pressure differential between the high and low pressures;

a shaft supported for rotation in said housing, said shaft having a lever arm and a switch arm extending outwardly from the shaft at spaced apart locations;

means coupling said piston with said lever arm in a manner to move an outer portion of the lever arm in a direction to



turn said shaft in a first rotative direction upon movement of said piston toward the low pressure port;

resilient means exerting a biasing force on said shaft urging said shaft in a second rotative direction opposite said first direction, said resilient means resisting movement of said piston toward the low pressure port when said pressure differential is below said preselected level but yielding to permit rotation of the shaft in said first direction when said pressure differential exceeds said preselected level;

a pair of seal elements sealing said shaft to said housing at locations on opposite sides of said lever arm to isolate said switch arm and resilient means from the fluid in said ports; and

switch means actuated by said switch arm upon movement of said shaft in said first rotative direction, said switch means thereby being actuated when the pressure differential exceeds said preselected level.

4,323,743

MEANS FOR OPERATING BLAST VALVE IN TWO-PRESSURE CIRCUIT BREAKER

Henry L. Peek, Naples, Fla., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Dec. 19, 1979, Ser. No. 105,083
Int. Cl.³ H01H *33/86*
U.S. Cl. 200—148 F **6 Claims**

1. In a power circuit breaker of two-pressure type including circuit interrupter means, a tank enclosing said means and confining therein a gas at a first, lower pressure, a reservoir confining the gas at a second, higher pressure, and a gas passage extending from said reservoir to the interruptor means, the improvement comprising:

valves means disposed in the gas conduit;

linkage means coupled to the interrupter means and operable to open and close the interrupter means;

a lever coupled to said linkage means and mounted for rotating in an arc in a first direction in response to movement of said linkage to open the interrupter and rotating in said arc in a second direction in response to movement of said linkage to close said interrupter, said lever having a projection thereon;

a crank having a first and a second end and being pivotally

mounted intermediate said ends at a point between said valve means and said arc;

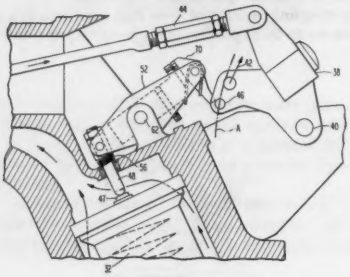
a pushrod pivotally attached to the first end of said crank;

guide means for confining said pushrod to a path whereby the pushrod will intercept said valve means as said crank pivots about its pivotal mounting;

a latch pivotally mounted upon the second end of said crank, said latch having an end extending into a portion of the arc traversed by said projection of said lever;

spring means carried by said crank biasing said latch for rotation in a first direction toward said lever;

second spring means biasing said crank to rotate in a direction to cause said latch to approach said arc; and



a stop mounted on said crank and confronting said latch for limiting rotation of said latch caused by said spring means;

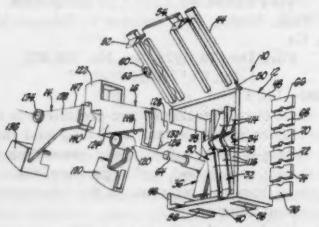
whereby rotation of said lever in said arc in a first direction urges said projection against said latch, said latch moving free of said arc after said crank has rotated by a predetermined amount, and after encountering said valve means; said projection interfering with said latch when said lever rotates in said second direction to cause said latch to be deflected against the pressure of said spring means, said projection and said lever being thereby allowed to return to their quiescent state.

4,323,744

SWITCH FOR CONTROLLING A PLURALITY OF LIGHTING CIRCUITS

John J. Sheridan, Middletown; Allen K. Schwartz, Alexandria, and Willis H. Anderson, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1980, Ser. No. 195,185
Int. Cl.³ H01H *21/80*
U.S. Cl. 200—153 LB **3 Claims**



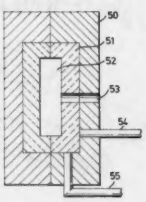
1. A switch for controlling a plurality of lighting circuits on a motor vehicle, comprising a housing; a first operating lever and a second operating lever supported in side-by-side relationship by said housing for pivotal movement about a common transverse axis; a first cam formed on said first operating lever; a first pair of contacts carried by said housing for controlling a first lighting circuit; a second cam formed on said second operating lever; a second pair of contacts carried by said housing for controlling a second lighting circuit, said first operating lever having a first position wherein said first cam closes said first pair of contacts to complete said first lighting circuit, and a second position wherein said first pair of contacts remain open, said second operating lever having a first position wherein said second cam closes said second pair of contacts to complete said second lighting circuit and a second position wherein said second pair of contacts remain open; and cooperating means formed on said first operating lever and said second operating lever permitting said first operating lever to independently close said first pair of contacts when moved from said second position to said first position and allowing said second operating lever to close said second pair of contacts and simultaneously shift said first operating lever to said first position to close said first pair of contacts when said first operating lever and said second operating lever are in said second position and said second operating lever is moved from said second position to said first position.

4,323,745

METHOD AND APPARATUS FOR EFFECTING BY MICROWAVES A SUBSTANTIALLY UNIFORM HEATING OF A MATERIAL IN A CAVITY

Benny Berggren, Vällingby, Sweden, assignor to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm, Stockholm, Sweden

Continuation of Ser. No. 892,014, Mar. 31, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 107,258
Claims priority, application Sweden, Apr. 7, 1977, 7704137
Int. Cl.³ H05B *6/74*
U.S. Cl. 219—10.55 A **4 Claims**



1. A microwave apparatus for substantially uniformly heating a dielectric material wherein microwave energy is supplied into a cavity in a manner causing at least two resonant modes to arise in the cavity, comprising: a metal enclosure, an insert made from a material, such as a ceramic material, with a low loss factor, said insert is contiguously enclosed by said metal enclosure, wherein the contacting surfaces of said insert conforms the shape of the inside surfaces of said enclosure, said insert further defines a cavity therein, a dielectric material to be heated which has a relatively high loss factor than said ceramic material, is attached to the surfaces within and substantially completely fills said cavity, means connecting at least two microwave energy sources to said cavity including means to effect simultaneous exciting of said cavity in at least two resonant modes, having different frequencies, which frequencies differ only slightly so that said at least two resonant modes arise and none of the zero points of the distribution of the electric energy density of said resonant modes conincides with any other zero points within said cavity.

4,323,746

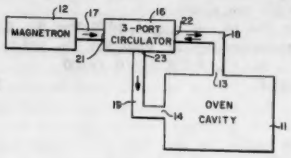
MICROWAVE HEATING METHOD AND APPARATUS

John E. Gerling, Cupertino, Calif., assignor to Jova Enterprises, Inc., Modesto, Calif.

Filed Jan. 28, 1980, Ser. No. 116,001
Int. Cl.³ H05B *6/70*
U.S. Cl. 219—10.55 F **5 Claims**

1. In a method for heating material in a microwave oven, the steps of: placing the material in the cavity of the oven, supply-

ing microwave energy to the oven cavity through a first feed port, a portion of said energy being reflected back into the port



from the oven cavity, intercepting the reflected energy which enters the first feed port, and feeding the reflected energy back into the oven cavity through a second feed port.

4,323,747

SAFETY APPARATUS FOR MICROWAVE COOKING DEVICES

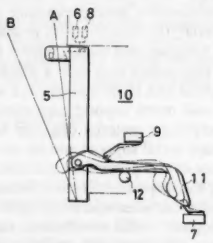
Tadayoshi Takase, Nagoya, and Yoshihiro Kanaya, Konan, both of Japan, assignors to Rinnai Kabushiki Kaisha, Fukuzumi, Japan

Filed Feb. 22, 1980, Ser. No. 123,734

Claims priority, application Japan, Jul. 26, 1979, 54-102334[U]

Int. Cl.³ H05B *6/68;* H01H *9/22*

U.S. Cl. 219—10.55 C **3 Claims**



1. A safety apparatus for a microwave cooking device, comprising, in combination, a source of electrical power; a load; a load circuit connected between said source and said load; door means with lock means; circuit breaking means and main interlocking switch means in said load circuit, the main interlocking switch means arranged to be opened upon an unlocking operation of said lock means; first door switch means mechanically coupled to the door means and arranged to be closed when said door means is opened by a predetermined amount, whereby a short circuit is established across the power source and in parallel with said load, the short circuit thereby detecting a failure of the main interlocking switch means to open in response to unlocking of the lock means, and whereby, upon the failure of the main interlocking switch means to open, the circuit breaking means will open to interrupt the circuit from the power source to the load; and a second door switch means connected to said load circuit on the electrical power source side of said first door switch means, said second door switch means being mechanically coupled to the door means and being opened when the door means is opened by a further predetermined amount, thereby disabling the short circuit once the failure of the main interlocking switch means has been detected and the circuit breaking means has been opened in response thereto.

4,323,748

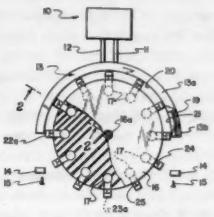
POWER TRANSFER SYSTEM

Robert W. Likins, Hoffman Estates, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 11, 1980, Ser. No. 139,427

Int. Cl.³ H05B *6/04;* H01R *39/26*

U.S. Cl. 219—10.71 **20 Claims**



1. An apparatus comprising:

a first and second means operatively associated with one another for movement of at least one said means relative to the other from a position away from one another to a position in contact,

each of said means having a separated pair of surfaces positioned for rubbing engagement with each other when said means are in said contact position and one of said means having its said pair of surfaces elongated in the direction of said rubbing engagement,

a power supply connected across said elongated pair of surfaces for activation to a state of electrical potential therebetween and the other of said pair of surfaces being electrically connected in circuit with a load adapted to intermittently receive said potential,

said means with said pair of surfaces elongated being shunted at portions spaced apart from said power supply connection, and

said first and second means are arranged when moving from said away from position to said contact position to first cross one of said shunted portions and then said power supply connections and finally the other of said shunted portions.

4,323,749

PROCESS AND APPARATUS FOR MACHINING BY ELECTRICAL DISCHARGES ALONG A SLANT AXIS

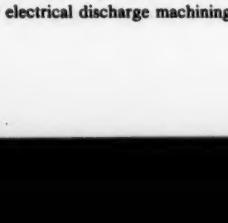
Michel P. Mazond, Annemasse, France, and Alain Wavre, Geneva, Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed Sep. 22, 1980, Ser. No. 189,798

Claims priority, application Switzerland, Oct. 9, 1980, 9053/79

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 M **8 Claims**



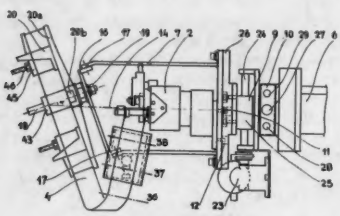
1. A process for electrical discharge machining of an elec-

trode workpiece by an electrode tool wherein said electrodes are displaced one relative to the other at least in one slant direction at a predetermined angle with the principal axis of feed motion of one electrode relative to the other, said process comprising setting the machining gap between said electrodes such as to maintain predetermined machining conditions, effecting consecutive machining passes in slant directions, displacing each of said slant directions as soon as the amplitude of said displacement reaches a predetermined value, and varying said limit value from one machining pass to the other, wherein the first of said slant directions is chosen in the course of the first machining pass such that machining is effected simultaneously on lateral and frontal surfaces of said electrode workpiece and each of said slanted directions is displaced in the course of subsequent machining passes such as to provide machining alternatively on lateral and on frontal surfaces of said electrode workpiece, and maintaining the speed of feed of said electrode tool into said electrode workpiece within predetermined limits in the course of each of said machining passes.

4,323,750
DEVICE FOR FEEDING, WITH ELONGATE LINING MATERIAL, AN INSTALLATION FOR LINING A TUBULAR MEMBER

Andre Marmorat, Le Creusot, and Arnold-Michel Robert, Montchanin, both of France, assignors to Framatome, Courbevoie, France

Filed May 9, 1980, Ser. No. 149,471
Claims priority, application France, May 11, 1979, 79 12009
Int. Cl.³ B23K *9/04, 9/28*
U.S. Cl. 219—76.1 **5 Claims**

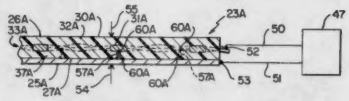


1. A device for feeding, with elongate lining material, an installation for lining a tubular member having a diameter of the order of 650 to 1,000 mm and which is arranged with its axis horizontal on a support enabling it to be rotated about its axis, said device comprising a horizontal arm mounted for vertical and horizontal translational motion and one end of which is introduced into the tubular member during the lining operation; a vertical welding head mounted on said one end of said arm and provided with means for guiding and carrying the elongate lining material along a path which has a vertical direction until the lining material is brought into contact with the internal surface of the tubular member to be welded to the internal surface thereof at a lower part of the tubular member during the rotation of the tubular member about its horizontal axis; a reel on which the elongate material is wound mounted in front of said welding head, that is to say on that side of said welding head closer to the end of the tubular member opposite that through which said welding head is introduced, said reel being mounted for rotation on an axle made fast with the front end of said arm and forming a small angle with the axis of said arm; and adjustable means for guiding the elongate material from a lower zone of said reel to an upper part of said welding head along a path which is adapted to the width and to the flexibility of the elongate material and terminates in a vertical path for introducing the elongate material into said means for guiding and carrying in said welding head.

4,323,751
METHOD OF WELDING WEAR MEMBER FOR RAILWAY VEHICLE

Donald L. Kleykamp, Springboro, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 64,229, Aug. 6, 1979, Pat. No. 4,249,665.
This application Sep. 22, 1980, Ser. No. 189,523
Int. Cl.³ B23K *11/10, 31/00*
U.S. Cl. 219—91.21 **9 Claims**



1. In a method of making a wear member for a railway vehicle wherein said vehicle comprises a pair of relatively moveable components and said wear member is adapted to be supported by one of said components and protects said components from wear during relative movement thereof; said method comprising the steps of; providing a metal support adapted to be supported on said one component; forming a reinforced antifriction liner having one surface thereof which is adapted to be disposed adjacent said metal support and having a smooth antifriction wear surface engageable by said other component; said forming step comprising, defining a plurality of openings in a metal structure and embedding said metal structure in polymeric material which serves as a matrix for and substantially completely surrounds said metal structure while simultaneously defining opposed surfaces of said polymeric material, said openings receiving said polymeric material completely therethrough during said embedding step resulting in better embedment of said metal structure, said structure providing reinforcement and preventing cold flow of said polymeric material; the improvement in said method comprising the step of securing said metal support to said metal structure after said embedding step with a plurality of metal members in mechanical and electrical contact between said metal structure and said metal support and extending through the thickness of polymeric material disposed between said metal structure and said metal support and its associated one of said opposed surfaces of said polymeric material, said step of securing comprising the steps of operatively connecting an electrical welding system between said metal structure and said metal support, holding said metal members in said mechanical and electrical contact, and electrically welding said metal members in position to said metal support with said electrical welding system thereby resulting in said liner of said wear member maintaining said smooth antifriction surface thereof yet being fixed to said metal support in a high strength manner.

4,323,752
PIPE RESISTANCE BUTT WELDING APPARATUS

Boris E. Paton, ulitsa Chkalova, 41-a, kv. 26; Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12; Sergei I. Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Vasily A. Sakharnov, ulitsa Solomenskaya, 41, kv. 93, and Boris A. Galyan, ulitsa Lenina, 88/92, kv. 110, all of Kiev, U.S.S.R.

Filed Apr. 2, 1980, Ser. No. 136,698
Claims priority, application U.S.S.R., Jun. 5, 1979, 2766303; Jun. 14, 1979, 2770751
Int. Cl.³ B23K *11/04, 37/04*
U.S. Cl. 219—101 **5 Claims**

1. A pipe resistance butt welding apparatus disposable within two pipes to be welded, comprising:

an elongated carrying body having means defining an inner surface and two coaxially mounted disks and carrying a plurality of elements, said elements including:

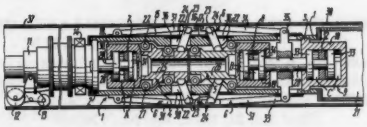
a fixed expanding clamp for holding one of the pipes to be welded in position with respect to said apparatus, comprising

first clamp elements and a first actuating cylinder, said first actuating cylinder consisting of a first movable part and a first fixed part, the first movable part of said first actuating cylinder being coupled with said first clamp elements and adapted for movement on the inner surface of said carrying body, and the first fixed part being rigidly attached to a respective one of said coaxially mounted disks;

a movable expanding clamp for locating said apparatus in the other of the pipes to be welded, comprising

second clamp elements and a second actuating cylinder, said second actuating cylinder consisting of a second movable part and a second fixed part, the second movable part of said second actuating cylinder being coupled with said second clamp elements and adapted for movement on the inner surface of said carrying body;

a third cylinder serving to move said movable expanding clamp axially for drawing together ends of the pipes to be welded and accomplishing upsetting of the pipe ends, said



third cylinder consisting of a third movable part and a third fixed part, of which the third movable part is connected with said second actuating cylinder of the movable expanding clamp and the third fixed part is rigidly attached to the other of said coaxially mounted disks, said fixed expanding clamp, movable expanding clamp, said first and said second actuating cylinders, and said third cylinder being installed in a coaxial relationship;

drive means for moving said apparatus along the pipes being welded, and

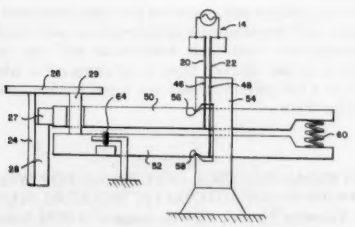
a ring welding transformer.

4,323,753

METHOD AND APPARATUS FOR WELDING AUTOMOTIVE BRAKE SHOES

Lawrence A. Boros, Ashtabula, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1980, Ser. No. 182,048
Int. Cl.³ B23K *11/02, 11/32*
U.S. Cl. 219—107 **11 Claims**



7. In an apparatus for welding an edge surface of a curved metal brake shoe web to a metal brake shoe table having a greater radius of curvature than said brake shoe web edge includes means for positioning said brake shoe table in longitudinal alignment with said brake shoe web and means for completing a positive electrical connection between said brake shoe table and a first electrode and between said brake shoe web with a second electrode, the improvement comprising:

pressure responsive means mounting said first electrode;

means mounting said second electrode for movement capable of completing said positive electrical connection with said brake shoe web;

means for interlocking said means mounting said first electrode to said means mounting said second electrode to move said second electrode into completing said positive electrical connection with said brake shoe web in response to said first electrode completing said electrical connection with said brake shoe table; and

means for pressing the abutting surfaces of said brake shoe table and said brake shoe web together and for activating said pressure responsive means.

11. A method of welding an edge surface of a curved metal brake shoe to a metal brake shoe table surface having a greater radius of curvature than said brake shoe web edge which includes positioning said brake shoe table in longitudinal alignment with said brake shoe web with one end portion of said table surface abutting the brake shoe web surface over a predetermined distance and contacting said brake shoe table with a first electrode and said brake shoe web with a second electrode, wherein the improvement comprises:

compressing said brake shoe table into contact with said brake shoe web and simultaneously moving said first electrode into contact with said brake shoe table; and

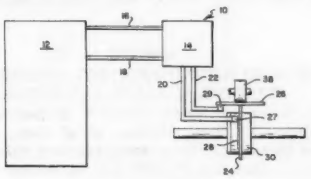
completing a positive electrical connection between said second electrode and said brake shoe web in response to the movement of said first electrode into contact with said brake shoe table.

4,323,754

WELDING AUTOMOTIVE BRAKE SHOES BY HIGH FREQUENCY RESISTANCE WELDING

Lawrence A. Boros, Ashtabula, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1980, Ser. No. 182,049
Int. Cl.³ B23K *11/32*
U.S. Cl. 219—107 **8 Claims**



1. A method of welding an edge surface of a curved metal brake shoe web to a metal brake shoe table surface having a greater radius of curvature than said brake shoe web edge comprising:

positioning said brake shoe table in longitudinal alignment with said brake shoe web with one end portion of said table surface abutting said brake shoe web surface over a predetermined distance and with said table surface diverging away from said brake shoe web edge surface and forming a vertex where said surfaces abut,

pressing said abutting surface together at said vertex,

contacting said diverging surface of said brake shoe table with an electrode spaced from said vertex,

contacting said brake shoe web with an electrode,

providing a high frequency alternating potential to said electrodes contacting said table and said web to induce current to flow therebetween and thereby heat the interfacing surfaces in the area of said vertex,

rotating said brake shoe table and said brake shoe web together along a curvelinear path while maintaining said

pressure and said high frequency heating current to melt said interfacing surfaces together, said rotation starting a predetermined time after said current is induced to flow between said table and said web,

stopping said rotation before said electrode contacting said table traverses the other side of said diverging table surface; and

reducing said alternating potential and thereby allowing said high frequency current to dissipate.

4,323,755

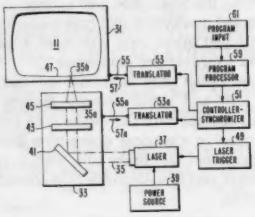
METHOD OF MAKING A MACHINE-READABLE MARKING IN A WORKPIECE

Morton J. Nierenberg, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 77,915

Int. Cl.³ B23K *26/08*; G01D *15/14*

U.S. Cl. 219—121 LJ **4 Claims**



1. A method for producing a machine-readable coded marking in a surface of a workpiece comprising:

(1) targetting a series of contiguous, substantially parallel strip-like areas of unit widths on said surface,

(2) and vaporizing simultaneously all of the surface portions of each of selected ones of said areas with radiant energy according to a prearranged program related to said marking, some of said selected areas being contiguous.

4,323,756

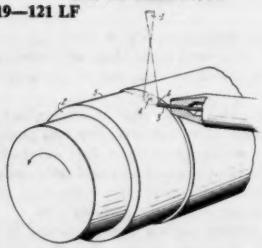
METHOD FOR FABRICATING ARTICLES BY SEQUENTIAL LAYER DEPOSITION

Clyde O. Brown, Newington; Edward M. Breinan, Glastonbury, and Bernard H. Kear, Madison, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 29, 1979, Ser. No. 88,808

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LF **11 Claims**



1. A method for producing metallic articles including the steps of:

a. providing a starting substrate;

b. providing a focused energy beam having sufficient energy to melt the substrate and directing this beam so that it strikes the substrate, thereby establishing an interaction zone;

c. providing relative motion between the energy beam and the substrate so as to control the interaction between the energy beam and the substrate so that surface melting of the substrate occurs without significant surface vaporization;

d. introducing feedstock into the interaction zone in such a fashion that it combines with the surface melted region on the substrate and melts completely, with the volume of feedstock added being less than the volume of melted substrate material and with the melted zone solidifying rapidly after it leaves the interaction zone; and

e. repeating steps (a) through (d) (with the substrate being the original substrate plus the added solidified feedstock material) to build up the desired article whereby each portion of the applied feedstock is melted more than once during the process.

4,323,757

METHOD FOR CUTTING SPECIFIC LAYER OF SYNTHETIC RESIN LAMINATED FILM

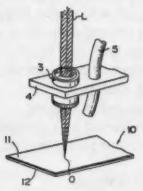
Yoshitake Oka, Kyoto; Tetsuo Ishihara, Itami; Masane Suzuki, and Motonori Kanaya, both of Ohmiya, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 31, 1980, Ser. No. 174,065

Claims priority, application Japan, Aug. 3, 1979, 54/99315

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LN **14 Claims**



1. A cutting method, which comprises the steps of:

providing a laminated film comprising at least two layers made of synthetic resin, wherein one of said layers is strippable from the other layer and contains coloring matter so that its spectral absorption characteristic is different from the spectral absorption characteristic of the other layer;

focusing a laser beam on said one, strippable layer, said laser beam having a wave length such that it is absorbed by said one, strippable layer and is transmitted through said other layer;

effecting relative movement between said laminated film and said laser beam along a predetermined path, while maintaining said laser beam focused on said one, strippable layer, so that said one layer is cut along a line whereby to form a cut pattern in said one layer, without cutting the other layer.

4,323,758

UNIVERSAL CONTROL STRUCTURE FOR WELDING DEVICES OF AN AUTOMATIC WELDING MACHINE

Franz Vokurka, Vienna, Austria, assignor to IGM-Industriegeräte und Maschinenfabriks-Gesellschaft mbH, Wiener Neudorf, Austria

Filed Dec. 14, 1979, Ser. No. 103,795

Claims priority, application Austria, Dec. 18, 1978, 9026/78

Int. Cl.³ B23K *9/28*

U.S. Cl. 219—125.1 **5 Claims**

1. An automatic welding machine, comprising

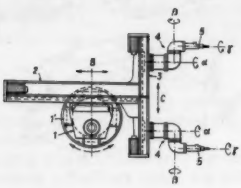
a longitudinal column defining an axis A,

an elongated carrier defining a longitudinal axis B being

displaceably mounted on said column in directions along said axis A and B, respectively,

a beam defining a longitudinal axis C perpendicular to said axes A and B rigidly connected to an end of said carrier, said beam by means of said carrier being movably supported by said column, said carrier is displaceably guided on said column both in the direction of the longitudinal axis B of said carrier as well as in the direction of axis A (perpendicularly to the axis B) such that said beam is displaceable both in a direction axis B (perpendicular to its longitudinal axis C) as well as in a direction axis A (perpendicular to its longitudinal axis C),

at least two holder means holding welders, respectively, said



holder means are independently displaceably, mounted on said beam along said axis C,

a plurality of articulation means on each of said holder means for swinging, deflection and rotation thereof about axes α, β and γ, respectively, thereof,

a plurality of drive means coordinated to said holder means and respectively to said welders held on said holder means, respectively, for welding seams non-symmetrically, parallel or symmetrically to each other, for displacing said at least two holder means independently and dependently, respectively, on said beam and for moving said articulation means on said holder means for the swinging, deflection and rotation of the articulation means and said welders held on said holder means respectively.

4,323,759

ELECTRICAL INTER-CONNECTION METHOD

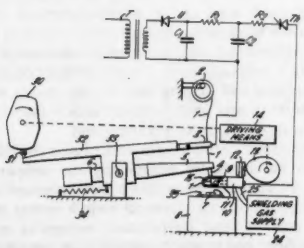
Donald A. Edson; Keith I. Johnson, and Michael H. Scott, all of Cambridge, England, assignors to The Welding Institute, Abington, England

Division of Ser. No. 925,458, Jul. 17, 1978, abandoned. This application Feb. 21, 1980, Ser. No. 123,492

Claims priority, application United Kingdom, Jul. 26, 1977, 31346/77

Int. Cl.³ B23K *11/22, 31/00*

U.S. Cl. 219—137 PS **1 Claim**



1. A method of forming a ball on a wire of aluminium or aluminium alloy by spark discharge to permit ball bonding of the wire to a component or terminal, comprising the step of forming the spark discharge by applying a voltage between 350v and 10,000v across a gap between an electrode and the wire in a shielding atmosphere, the circuit resistance being such that the peak current density in the wire section is from $1.2\times10^9 A/m^2$ to $13.5\times10^9 A/m^2$.

4,323,760

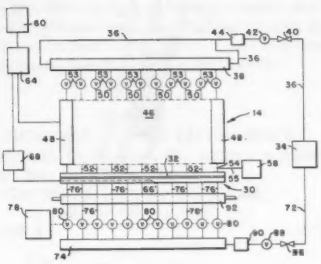
METHOD AND APPARATUS FOR TEMPERATURE CONTROL OF HEATED FLUID IN A FLUID HANDLING SYSTEM

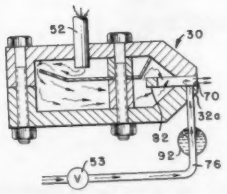
John M. Greenway, and Don M. Bylund, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 13, 1979, Ser. No. 103,255

Int. Cl.³ H05B *1/00;* **D06C** *29/00, 23/00*

U.S. Cl. 219—364 **8 Claims**





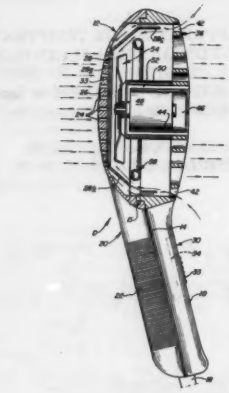
1. Apparatus for directing at least one stream of pressurized, heated fluid in a desired direction while maintaining generally uniform temperature in the heated fluid stream, comprising a manifold defining an elongate compartment for receiving pressurized heated fluid and including outlet means for directing heated fluid outwardly therefrom in at least one stream disposed along the length of the manifold compartment; a plurality of fluid inlet conduits respectively communicating with said manifold compartment at generally uniformly spaced locations along the length thereof; an individual heater associated with each of said fluid inlet conduits to heat fluid passing therethrough; means for supplying energy generally uniformly to each heater to heat the same; temperature determining means associated with each of said inlet conduits for determining the temperature of the heated fluid adjacent the location of communication of each of said inlet conduits with said compartment; and valve means in each inlet conduit for incrementally adjusting the flow of fluid through each inlet conduit and its associated heater to thereby regulate the temperature of the fluid in said spaced locations along said manifold compartment and establish a uniform temperature of the fluid along the length of the compartment as determined by said temperature determining means.

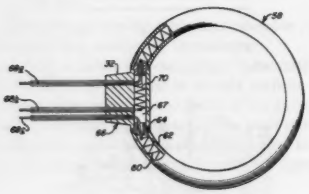
4,323,761

RADIANT HEAT HAIR DRYER

Otto Hubner, Mauerkircher Strasse 199, Herzog Park, Munich (8000 Munchen 81), Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,404
Int. Cl.[3] H05B 3/40; A45D 20/10
U.S. Cl. 219—377 8 Claims





1. In a hand held hair dryer having means for directing air flow toward hair to be dried, the improvement comprising, in combination:

a casing having a forward grille-like support member adapted to be faced toward the hair to be dried;

an infra-red, ring-shaped, radiator in said casing spaced rearwardly of the grille-like member;

a motor carried on the grille-like member and extending rearwardly thereof centrally of said ring-shaped radiator;

shield means between the ring-shaped radiator and the motor for protecting the motor from the infra-red radiation;

radiation reflector means, including a portion spaced rearwardly of the ring-shaped radiator for directing reflected radiation toward and through the grille-like member;

a flat air propeller operatively associated with and driven by the motor and located spaced axially formed of the rearward portion of the reflector and rearward of the ring-shaped radiator, the propeller being operative to direct only a gentle flow of air through said grille toward the hair to be dried, to avoid destruction and disarray of the hairdo, but to move the top layers of hair sufficiently to permit radiation drying of the hair mass; and

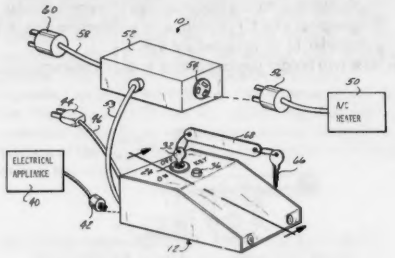
means for introducing cooling air into the casing to cool portions of the casing and the motor.

4,323,762

ENERGY-TEMPERATURE OCCUPANT MONITOR APPARATUS

Ron E. Ervin, P.O. Box 117, Mt. Pleasant, Mich. 48858, and Noble Belcher, 806 N. Webster, Saginaw, Mich. 48602

Filed May 7, 1980, Ser. No. 147,477
Int. Cl.[3] H05B 1/02
U.S. Cl. 219—482 6 Claims



1. Apparatus selectively connecting an electrically powered device and a heating and cooling means located within a predetermined area having means for controlling access thereto to a source of electrical energy comprising:

an electrical switch means disposed within said predetermined area and switchable between first and second positions and connectable between said electrically powered device and said heating and cooling means and said source of electrical energy for selectively connecting and disconnecting said electrically powered device and said heating and cooling means to said source of electrical energy;

actuating means for switching said electrical switch means between a first position disconnecting said electrically powered device from said source of electrical energy and a second position connecting said electrically powered device to said source of electrical energy;

said actuating means being lockably engaged with said electrical switch means when said electrical switch means is in said second position thereby preventing the disengagement of said actuating means from said electrical switch means;

said actuating means secured to and carried by said access controlling means such that said electrical switch means must be switched to the first position in which said electrically powered device is disconnected from said source of electrical energy before said access controlling means can be removed from said predetermined area;

means for automatically maintaining the temperature of said predetermined area above a predetermined minimum temperature when said electrical switch means is disposed in the first position, said temperature maintaining means including a temperature responsive element connected so as to energize said heating and cooling means when the temperature of said predetermined area is below the predetermined minimum temperature; and

means, responsive to the temperature of said predetermined area, for automatically maintaining the temperature of said predetermined area within a predetermined temperature range when said electrical switch means is in said second position, said temperature responsive means including first and second temperature sensing means adapted to switch to a closed state at a preset first lower temperature and a preset second higher temperature, respectively, said first and second temperatures defining the predetermined temperature range, said first and second temperature sensing means being connected so as to disconnect said heating and cooling means from the source of electrical energy when the temperature of said

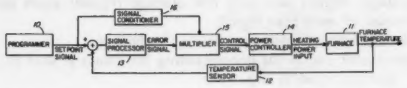
predetermined area is outside of the predetermined temperature range.

4,323,763

PARAMETRIC POWER CONTROLLER

Jeff M. Goldsmith, Medford, Mass., assignor to GCA Corporation, Bedford, Mass.

Filed May 14, 1979, Ser. No. 38,646
Int. Cl.[3] H05B *1/02*
U.S. Cl. 219—497 8 Claims



1. A furnace temperature controller comprising:

a programmer providing a set point signal representing a desired temperature;

temperature sensing means responsive to the furnace temperature for providing a feedback signal representing said furnace temperature;

power controller means for varying the heating power applied to the furnace as a function of a control signal applied to said power controller means;

means responsive to said set point signal and said feedback signal for generating an error signal which varies as a function of the difference between the furnace temperature and the desired temperature but which has a predetermined maximum value equal to the level of control signal corresponding to the maximum power available from said power controller means; and

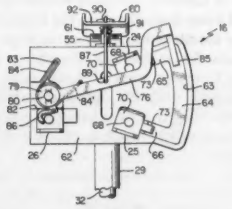
a multiplier responsive to said set point signal and said error signal for providing to said power controller means a control signal having a range which varies as a function of said set point signal thereby to limit the heating power which can be applied to said furnace.

4,323,764

CONTROL SYSTEM AND CONTROL DEVICE FOR CONTROLLING A HEATING UNIT AND METHOD OF MAKING AND OPERATING THE SAME

James R. Willson; William H. Conway, and William N. Smith, all of Midlothian, Va., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 21, 1980, Ser. No. 170,716
Int. Cl.[3] H05B *1/02*
U.S. Cl. 219—497 2 Claims



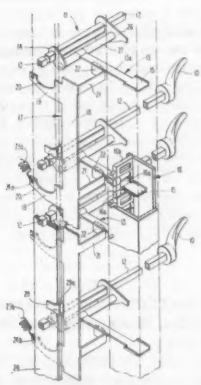
1. In a control system for a heating means that has control means for comparing a variable electrical signal that has a value in relation to the output temperature of said heating means and a selected electrical signal that has a value in relation to a selected temperature setting to control the operation of said heating means to tend to produce an output temperature substantially equal to said selected temperature, the improvement wherein said control means comprises a control device having a rod and tube temperature sensing unit for providing linear motion of a part thereof in relation to the output temperature of said heating means and having a potentiometer provided with an electrical output producing means operatively interconnected to said part of said unit so as to produce said variable electrical signal in relation to the output temperature of said heating means, and means for terminating the operation of said heating means when the output temperature of said heating means exceeds a predetermined temperature, said means for terminating the operation of said heating means being operatively interconnected to said part of said control device, said means for terminating the operation of said heating means comprising an electrical switch carried by said control device and having a movable switching member, said unit comprising a tube means and a rod means, said rod means comprising said part of said unit and abutting said switching member to control movement thereof, a lever means pivotally mounted to said device and being operatively interconnected to said output producing means of said potentiometer to control the same in relation to movement of said lever means, and a movable plunger carried by said device and having opposed ends respectively abutting said switching member and said lever to translate movement of said switching member to said lever means and, thus, said linear motion of said rod means to said output producing means of said potentiometer.

4,323,765

VERTICAL REVERSIBLE LIFTER PIECE

Ransom F. Shoup, II, Quakertown, Pa., assignor to Ransom F. Shoup & Co., Inc., Bryn Mawr, Pa.

Filed Mar. 2, 1981, Ser. No. 239,465
Int. Cl.[3] G07C *13/00*
U.S. Cl. 235—55 A 4 Claims



1. In a voting machine of the type which includes vertical columns of voting spindles, at least one interlock, each interlock having roller members retained in a channel of said interlock, a cam assembly on each spindle, each of said spindles connected to a pull strap for engaging said interlock, each of said pull straps having a wedge portion on one end, said wedge portion disposed between two of said roller members of said interlock, and shims selectively positioned in the channel of said interlock so that only a prescribed number of said wedge portions of said pull straps can be pulled between said roller members of said interlock, whereby only said preselected number of said pull straps can be activated into voting position, the improvement comprising:

A reversible lifter piece having a spine portion vertically disposed on said interlock, said lifter piece having a plurality of main guides, each of said main guides having a recessed portion contoured in a predetermined shape to accommodate movement of said spindle during voting,

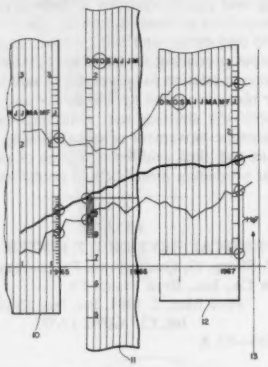
and a plurality of fingers extending at about a 90° angle from said spine portion of said lifter piece, each of said fingers supporting pull straps at spaced intervals along each column assembly.

4,323,766

DIAGRAM ANALYZING DEVICE WITH TABLE OF EVENTS FOR COMBINED INTERPRETATION OF PLURAL CURVES

Norbert Brachthäuser, Rennbahnstrasse 38, 6000 Frankfurt am Main 71, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 75,950
Int. Cl.³ G06C *3/00*
U.S. Cl. 235—89 R **16 Claims**



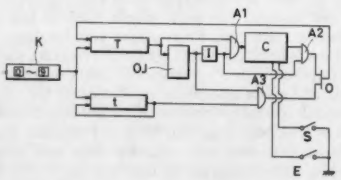
1. A diagram analyzing device for use in assisting in visual understanding of curves plotted as a function of time according to a standard logarithmic scale, said device comprising a rectangular calculating ruler which is fabricated from a transparent material and which can be freely moved within the plane of the curves to reading positions relative to the curves to be evaluated, said ruler including, located at one of the two longitudinal sides thereof, at least one standard logarithmic scale and located transverse to said logarithmic scale at least one linear time scale corresponding to the time units used in the curves and providing time subdivisions disposed in parallel to the elongate sides of the calculating ruler.

4,323,767

REPEATEDLY OPERABLE TIMER

Kunio Yoshida, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1978, Ser. No. 906,787
Claims priority, application Japan, May 20, 1977, 52-59219
Int. Cl.³ H03K *27/00*
U.S. Cl. 235—92 SH **2 Claims**



1. A continuously repeatable timer having a desired repeat time comprising:

circulating loop means including a first storage register, said circulating loop means decrementing an initial count stored in said first storage register corresponding to the desired repeat time and producing an output signal representative thereof;

a second storage register containing information indicative of said desired repeat time;

input means for preselectably introducing said desired repeat time into said first and second storage registers;

a zero detector means for monitoring the output signal produced by said circulating loop means and producing a zero signal each time the output signal produced by said circulation loop means is zero; and

means for repeatably placing the contents of said second storage register into said first storage register upon the receipt of each zero signal;

said circulating loop means further including;

subtractor means for decrementing the count in said first storage register, and

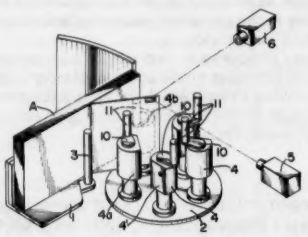
inhibit means for momentarily stopping the operation of said subtractor means when the zero signal is generated by said zero detector means.

4,323,768

APPARATUS FOR COUNTING SHEETS AND DISCRIMINATING DIFFERENT KINDS THEREOF

Shinya Uchida, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1979, Ser. No. 91,886
Claims priority, application Japan, Dec. 22, 1978, 53-159637
Int. Cl.³ B65H *3/12*
U.S. Cl. 235—92 SB **6 Claims**



1. In an apparatus for counting bendable sheets and discriminating different kinds thereof including a holder for holding a stack of bendable sheets in a vertical direction, a plurality of rotary suction heads for suckingly attracting the sheets to deflect them one at a time away from the stack thereby to count the number of the sheets, and means for discriminating different kinds of sheets by optically detecting the height of the sheet deflected away from the sack, the improvement comprising: supporting members mounted at the tops of said plurality of suction heads for supporting the sheet, which has been deflected away from said stack of sheets, in an upright state by making engagement with the opposite surfaces of the sheet, each of said supporting members being a vertical rod extending upwardly from a position which is outward of the periphery of said suction head.

4,323,769

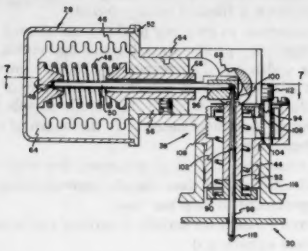
SELF-ALIGNING SCALING LOAD CELL

Johannes Sorteberg, 80 Delafield Island Rd., Darien, Conn. 06820

Filed Jun. 26, 1980, Ser. No. 163,226
Int. Cl.³ G06G *5/00*
U.S. Cl. 235—200 WB **18 Claims**

1. In a scaling load cell comprising a pair of push rods acting on a carriage riding on a plane substantially perpendicular to the plane defined by said rods, said carriage having an axle,

said perpendicular plane angularly adjustable about an axis substantially perpendicular to the plane of said rods and intersecting said carriage whereby forces applied to one of said



push rods produce forces on the other push rod at a ratio adjustable by adjusting said adjustable plane; the improvement comprising said push rods being in physical contact with and applying said forces directly to said axle.

4,323,770

UNIT PARTICULARLY FOR TAKING STAKES AND POSSIBLY DETERMINING THE WINNERS IN A GAME SUCH AS A NATIONAL LOTTO GAME

Gerard Dieulot; Mathias Juan, both of Paris, and Michel Fardeau, Les Milles, all of France, assignors to Societe d'Etude de Systems Avances et d'Amenagements, Neuilly-sur-Seine, France

Filed Jul. 16, 1979, Ser. No. 57,887
Claims priority, application France, Aug. 16, 1978, 78 23934
Int. Cl.[3] G06F *15/20, 15/44;* G06K *3/12*
U.S. Cl. 235—375 **8 Claims**

1. An integrated assembly for taking and processing stakes particularly for the game of Lotto, this assembly comprising a micro-processor to which are connected:

(a) at least one keyboard for the players, which comprises a series of number keys on which the player can generate his forecast and on each of which is associated an indicator light which lights up when the key is activated once and goes out when the key is activated twice, and function keys comprising at least a bet validation key which controls the display of bets entered by the player and the cumulative amount of the stakes on a display unit, said cumulative amount being reported in such a way as to be read by an operator, a key to permit the retroactive display of the preceding bets on the said display unit, a key controlling the successive redisplay of the bets, and an end-of-play key to block the keyboard while waiting for payment;

(b) one keyboard for the cashier which comprises at least for each keyboard of the players, a validation key allowing to clear said player keyboard, after payment and to control the printing of a receipt ticket;

(c) an information recording unit proper to the play furnished by the said keyboards along with identification and checking information, this unit being controlled by the validation key of the cashier's keyboard;

(d) a printer to deliver the receipt ticket which forms the proof for payment of the possible winnings of the bettor and which reproduces the whole of the information acquired from the information recorded by the recording unit; and

(e) operations carried out for each of the keyboards by the micro-processor are the following:

(a) scanning of the keyboard and detection of the release of a key;

(b) determination of the code of the key considered;

(c) cancelling of the key when it is again actuated;

(d) processing of the numbers which comprises
buffer stacking of the numbers;
the checking of the number of the numbers per wager;
multiple wager information (for example by winking of the indicator lights);
checking the number of wages;
return to keyboard scanning;

(e) processing of the function keys which comprises:
validation which is only effected if the number of the numbers chosen is compatible with the rules of the game;
checking of the total amount to be paid;
display of the wager on a display unit;
resetting of the indicator lights of the keyboard
return to scanning the keyboard;

(f) display on request by pressing a key indicating an upward pointing arrow of the preceding play and scanning of the keyboard;

(g) display of the following bets by pressing a key indicating a downward pointing arrow this control being effected only after a control effectuated on the upward pointing arrow until the last wager, except if the amount is greater than the upper limit of the wagers, this operation being followed by return to scanning the keyboard;

(h) the end of the play order which is given if at least one bet is displayed on the display unit and which blocks the keyboard while waiting for payment and validation of the play by the cashier, which allows:

(i) the taking of bets by transfer of the list of bets, this operation comprising:
the order for printing from the recording unit with checking coders,
rereading of this tape,
the order for printing the receipt ticket,
resetting of all the displays,
return to scanning the keyboard.

4,323,771

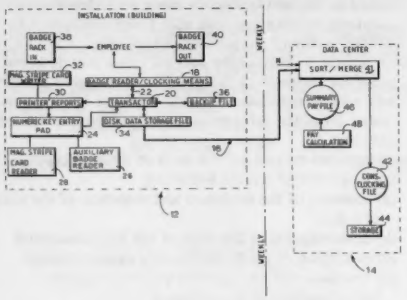
AUTOMATED TIME AND ATTENDANCE SYSTEM

Oliver H. Chalker, Jr., 43 Meadowood La., Old Saybrook, Conn. 06475, and Robert J. Spooner, 65 Main St., Essex, Conn. 06426

Filed Sep. 10, 1979, Ser. No. 74,134
Int. Cl.[3] G06K *1/00*
U.S. Cl. 235—377 **18 Claims**

1. An employee time and attendance system having a central processor and a plurality of subsystems each capable of generating data in a form utilizable by the central processor, wherein at least one subsystem comprises: an identification means for each of a plurality of employees which includes identifying employee data particular for each employee; a transactor; a clocking means connected to said transactor and capable of providing clocking-in and clocking-out of employees and a

corresponding clocking data output; said clocking means is adapted to receive said identification means and convey the employee data along with the clocking data to the transactor; a data storage means connected to the transactor and capable



of storing clocking and employee data for a plurality of employees; and an input means connected to the transactor capable of supplying data thereto, adjusting data received by the transactor and recalling data from the data storage means.

4,323,772

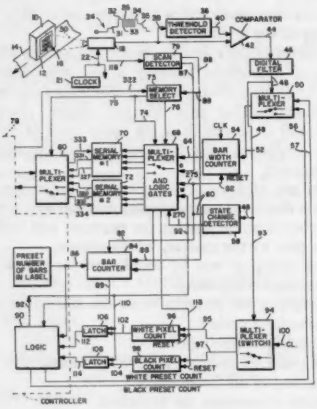
BAR CODE READER SYSTEM

Richard F. Serge, Lewisville, N.C., assignor to R. J. Reynolds Tobacco Company, Winston Salem, N.C.

Filed Mar. 6, 1980, Ser. No. 127,674

Int. Cl.³ G06K *7/10*

U.S. Cl. 235—463 **36 Claims**



1. An optical reader system for bar codes having narrow and wide code bars of first and second contrasting optical characteristics, said system comprising:

Scanner means for optically scanning a bar code and for producing an analog signal corresponding to the bar code image;

said scanner means including a plurality of picture elements each responsive to that portion of the image of said bar code which impinges thereon to produce a corresponding pixel output signal, and means for sequentially scanning said pixel output signals to produce said analog signal; dynamic threshold detector means responsive to the amplitude of said analog signal to produce a D. C. threshold signal equal to the average value of said analog signal; comparator means responsive to said D. C. threshold signal and to said analog signal for converting said analog signal to a corresponding binary signal;

digital filter means for eliminating selected narrow-width binary signals caused by aberrations in said analog signal to produce a filtered binary signal;

means responsive to changes in the state of said filtered binary signal for producing a train of bar width signals, each bar width signal corresponding to, and providing a measure of, the width of a corresponding one of successive code bars, said train of bar width signals thereby providing an individual measure of the width of each bar of said bar code;

first logic means responsive to successive bar width signals for producing digital data signals corresponding to the code represented by said bar code;

digital memory means for serially receiving and storing said digital data signals; and

second logic means for selectively inhibiting and clearing said memory means, whereby data signals relating to only a single bar code at a time are entered in said memory means.

4,323,773

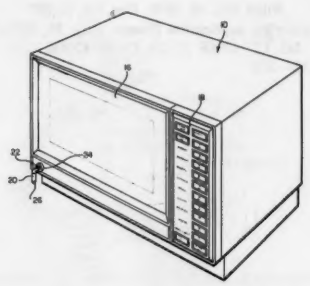
BAR CODE CONTROLLED MICROWAVE OVEN

Lowell L. Carpenter, New Hope, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 17, 1980, Ser. No. 112,997

Int. Cl.³ G06K *7/10*; H05B *6/64*; G06F *15/20*

U.S. Cl. 235—473 **11 Claims**



1. In a microwave oven including a magnetron power source and a control means for controlling said magnetron power source in response to input data manually entered by the oven user, the improvement comprising:

optical codes respectively associated with each of said input data, each code including a series of bars and spaces having distinguishable optical characteristics;

optical reading means, including a scanner movable adjacent said respective optical codes for reading same by determining the respective optically characteristic bars and spaces and providing a control signal representing said associated input data; and

means coupling and entering said control signal to said control means for controlling said magnetron power source in response to said optically read code.

4,323,774

CIRCUIT FOR REFLECTIVE MODE OPTICAL READER

Arthur R. Kopp, Lewisberry, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 2, 1980, Ser. No. 155,906

Int. Cl.³ H01J *40/14*

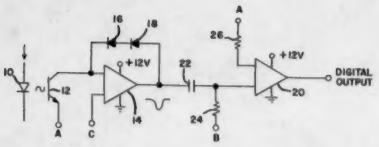
U.S. Cl. 250—214 A **6 Claims**

1. In a reflective mode optical reader, an improved circuit

for controlling a phototransister in such manner as to be responsive to low reflected ligh levels, said circuit comprising:

a phototransister having its emitter connected to a bias voltage,

an operational amplifier connected to the collector of said phototransister,



a pair of series connected diodes connected across said operational amplifier, and

bias voltage means applying bias voltage to said phototransister and said operational amplifier in such manner that said collector is biased one diode voltage drop more positive than said emitter so that collector to base voltage is zero and no leakage current present whereby the phototransistor is operational at current levels near ordinary leakage current levels.

4,323,775

DIVIDED EXPOSURE METHOD AND DEVICE

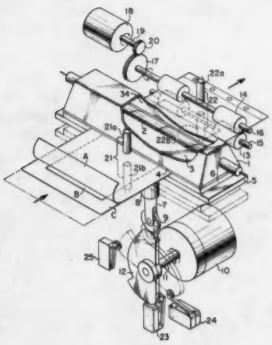
Takanori Hasegawa, Hachioji; Takanobu Shimada, Machida; Takao Sato, Tokyo; Masakazu Kera, Yokohama; Shuntaro Yoshida, Tokyo, and Shinichi Shimoyama, Sendai, all of Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Jun. 12, 1980, Ser. No. 158,773

Claims priority, application Japan, Jul. 30, 1979, 54-97944

Int. Cl.³ G03C *5/16*

U.S. Cl. 250—317.1 **10 Claims**



1. A method for exposing a sheet assembly superposed one sheet over the other comprising the following steps:

subjecting a sheet of substantially transparent heat alterable substance and an original sheet with a totally integral image thereon to light radiation while under pressure, wherein successive portions of the sheet assembly which bear different parts of said image but slightly overlap one another are sequentially clamped between a pressure plate and a light transmitting plate, with the original sheet being closer to the pressure plate, and are irradiated with electromagnetic radiation through the light transmitting plate in the clamped condition.

4,323,776

INFRARED PARALLEL SCANNING ARRANGEMENT

Clive A. Bridges, and Patrick J. O'Donnell, both of Berkshire, England, assignors to The Marconi Company Limited, Chelmsford, England

Filed Jul. 9, 1980, Ser. No. 166,802

Claims priority, application United Kingdom, Jul. 19, 1979, 25238/79

Int. Cl.³ H01J *31/49*

U.S. Cl. 250—332 **10 Claims**

1. An image translation device comprising:

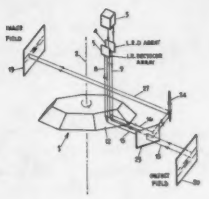
(A) an object field and

(B) an image field,

(C) an array of electro-optical transducer elements,

(D) means for scanning said array of elements in parallel in a first direction across said object field repeatedly,

(E) means for periodically displacing the scan in a second direction transverse to said first direction by an amount which is at least subjectively random within limits,



(F) means responsive to the output of said transducer elements to display a corresponding image in said image field, and

(G) means responsive to the amount of the scan displacement to provide correlation between the elements of the object field and the elements of the image field.

4,323,777

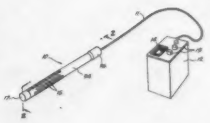
HYDROCARBON GAS ANALYZER

Lowell L. Baskins, and Rodney M. Durham, both of Santa Barbara, Calif., assignors to Infrared Industries, Inc., Santa Barbara, Calif.

Filed May 19, 1980, Ser. No. 151,451

Int. Cl.³ G01N *21/26*

U.S. Cl. 250—339 **11 Claims**



1. Apparatus for determining the flammability index of hydrocarbon fuel vapors, comprising:

an infrared energy source for directing infrared energy therefrom along a predetermined path;

means for holding a sample of the fuel vapors in said path;

a filter located in the path to receive the infrared energy from said sample, said filter passing a range of infrared energy therethrough substantially corresponding to the absorption band of alkanes;

means responsive to the filtered infrared energy for generating a signal functionally related to the concentration of alkanes in the gas sample; and

temperature sensing means in thermal communicating relationship with the gas sample; and

means actuated by said temperature sensing means to compensate the signal for changes in gas sample temperature.

4,323,778

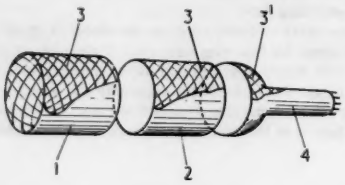
RADIATION DETECTORS SUPPORTED BY RESILIENT OPTICAL COUPLER

John S. Wykes, Allenton, and Ian Adsley, Branston, both of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation-in-part of Ser. No. 911,247, May 31, 1978. This application Jun. 2, 1978, Ser. No. 911,868

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—367 6 Claims



1. A radiation sensor comprising at least two scintillation crystals, resilient support means for supporting the at least two crystals in a desired operational configuration and detector means for detecting scintillations caused in the crystals by radiation impinging thereon, said support means being transparent to electromagnetic radiation within a frequency range including that of the scintillations, the support means further allowing the crystals to mechanically vibrate independently of one another, and having cutouts adjacent to the scintillation crystals along a path followed by incident radiation into the sensor.

4,323,779

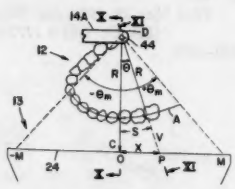
SCANNING RADIOGRAPHIC METHOD

Richard D. Albert, 317 Hartford Rd., Danville, Calif. 94526

Division of Ser. No. 803,077, Jun. 3, 1977, Pat. No. 4,196,351. This application Dec. 5, 1979, Ser. No. 100,422

Int. Cl.[3] H05G *1/26*

U.S. Cl. 250—401 6 Claims



1. A method for alleviating image distortion in a scanning X-ray system wherein an electron beam is scanned along a predetermined raster line on the target plate of an X-ray tube to produce a moving point source of X-rays and wherein the region of the subject which is to be imaged is situated between the target plate and an X-ray detector (having a radiation-sensitive area smaller than the area of said target plate is situated on the opposite side of a subject to be imaged,) comprising the step of varying the rate of scanning movement of said electron beam along said predetermined raster line in a programmed manner dependent on the position of a momentary point of impact of said electron beam on said target plate relative to the position of a fixed specific point on said predetermined raster line. (as a function of the distance of the point of impact of said electron beam on said target plate from the specific point on said predetermined raster line which is closest to said detector.)

4,323,780

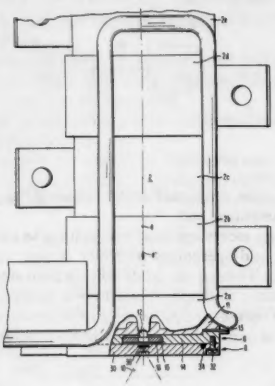
TARGET ASSEMBLY FOR A LINEAR ACCELERATOR

Dennis Tombaugh, Concord; Nick Martinsen, Pleasanton; Edgar B. Symmons, Walnut Creek, all of Calif., and Lothar Heinz, Neunkirchen, Fed. Rep. of Germany, assignors to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Jul. 21, 1980, Ser. No. 170,608

Int. Cl.[3] H05G *1/02;* H01J *35/08*

U.S. Cl. 250—419 14 Claims



1. A target assembly for a linear accelerator comprising, in combination:

(a) a metal plate having two end faces;

(b) a first recess in one of said end faces;

(c) a target for generating X-rays when hit by high-energy electrons, said target being arranged in said first recess such that said first recess is divided into two chambers; and

(d) a cooling channel in said metal plate for directing a cooling medium therethrough, said cooling channel passing through said two chambers thereby exposing said target directly to said cooling medium when said cooling medium is flowing through said cooling channel.

4,323,781

TOMOGRAPHIC X-RAY DIAGNOSTIC UNIT WITH THE SECONDARY OF THE HIGH VOLTAGE TRANSFORMER ROTATING WITH THE X-RAY SOURCE

Heinz Baumann; Werner Kuehnel, both of Uttenreuth, and Manfred Rattner, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 94,766

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855379

Int. Cl.[3] G21K *5/10*

U.S. Cl. 250—422 6 Claims

1. An X-ray diagnostic unit for producing layer images of a radiography subject, comprising a patient support, a rotatable scanning system for irradiating the radiography subject from various directions having an X-ray tube, which emits a beam of X-rays penetrating the layer to be examined and whose dimension perpendicular to the layer plane is equal to the layer thickness, a radiation receiver which supplies electrical output signals corresponding to the measured radiation intensity, an X-ray high voltage generator for supplying the X-ray tube and a processing unit connected to the radiation receiver for calculating the attenuation values of specific image points of the irradiated body layer from the output signals of the radiation receiver, characterized in that, an inductive coupling means (FIGS. 2, 5, 6, 7, 8) is provided for transmitting energy to the X-ray tube (7), having a secondary winding (22, 33, 41, 42, 43)

arranged in a fixed position relative to the X-ray tube (7) and rotating with the scanning system (7, 8) and having a primary winding (21, 32, 39) stationary in the unit, characterized in that

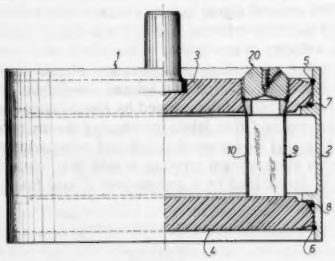
the primary winding (21, 32) and the secondary winding (22, 33) are constructed as concentric rings which enclose an opening (23) for receiving the radiography subject (1).

4,323,782

ABSORPTION RESOLUTION TESTING DEVICE

Esko Riihimaki, Espoo, and Seppo Savikurki, Helsinki, both of Finland, assignors to Hospital Physics Oy, Finland

Filed Feb. 29, 1980, Ser. No. 125,980
Claims priority, application Finland, Mar. 8, 1979, 790798
Int. Cl.[3] G02B 5/00; A61B 6/00
U.S. Cl. 250—252 10 Claims



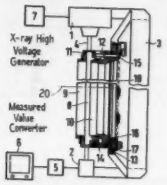
1. An absorption resolution testing device for testing the spatial resolution and the absorption resolution of computer tomography devices, comprising a larger vessel, a first liquid within said larger vessel, and a plurality of smaller vessels disposed within said larger vessel and said first liquid, a second liquid inside the smaller vessels having absorption values which are different from the absorption values of the first liquid inside said larger vessel, wherein the first liquid is distilled water and the second liquid comprises sugar dissolved in water in an amount between 0.1 and 2.0 percent by weight, and wherein said smaller vessels are of a wall thickness and materials such that they are transparent in computer tomography pictures.

4,323,783

TOMOGRAPHIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

Walter Distler, and Erich Kintopp, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 17, 1980, Ser. No. 141,058
Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921820
Int. Cl.[3] A61B 6/00
U.S. Cl. 250—445 T 3 Claims



1. Tomographic apparatus for producing transverse layer images of a radiography subject, comprising a radiation measuring arrangement which contains a radiation source which produces a beam of rays penetrating the radiography subject, the cross sectional extent of the beam perpendicular to the layer plane being equal to the layer thickness, as well as containing a radiation receiver which determines the radiation intensity behind the subject, a rotating device for the measuring arrangement for irradiating the radiography subject from different directions and a measured value converter for the transformation of the signal supplied by the radiation receiver into a layer image, and beam confining means between the radiation source and the radiation receiver comprising two hollow cylinders of radiation-absorbing material having the same diameters and a common axis, between which a radiation permeable gap for the passage of the x-ray beam is left open and into which the radiography subject can be inserted, characterized in that the two hollow cylinders (9, 10), for the adjustment of the gap width, are adjustably mounted for relative displacement in an axial direction.

4,323,784

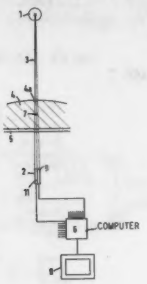
DIAGNOSTIC RADIOLOGY APPARATUS FOR PRODUCING LAYER IMAGES

Bernhard Conrad, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 17, 1980, Ser. No. 141,059
Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919810
Int. Cl.[3] A61B 6/00
U.S. Cl. 250—445 T 1 Claim

1. Diagnostic radiology apparatus for producing layer images of a radiography subject with a patient support, having a measuring arrangement for irradiating the radiography subject from different directions, comprising a radiation source which emits a radiation beam which penetrates the layer to be examined, the dimensions of said radiation beam perpendicular to the layer plane being equal to the layer thickness, and a radiation receiver which supplies electrical output signals which correspond to the radiation intensity measured, and having a computer connected to the radiation receiver for calculating from the output signals of the radiation receiver the attenuation values of specific points of the irradiated body layer, said radiation receiver comprising correction detector and absorber means for the radiation disposed in series such that output signals are supplied defining the mean radiation energy of the radiation receiver, characterized in that said correction detector and absorber means comprises an absorber in the form of a luminescent layer (9c) and at least two correction detectors

(9*a*, 9*b*) arranged in series in the direction of radiation and separated from one another by the luminescent layer (9*c*), said luminescent layer converting the radiation received into light to which the correction detectors are sensitive characterized in that the correction detectors (9*a*, 9*b*) of said correction detector and absorber means (9) have respective correction detector outputs, and a summing circuit connected with said correction detector outputs and having an output channel for supplying a summation signal which is a function of the signals supplied by said correction detectors.

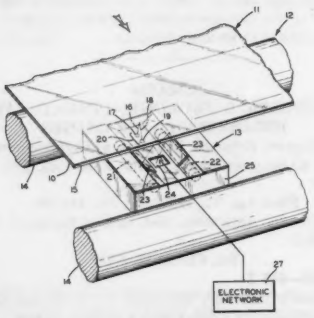


4,323,785

METHOD OF AND APPARATUS FOR OBSERVING SHEET SURFACES FOR TRACES OF FLUORESCENT MATERIALS THEREON

Walter D. McComb, Oregon, and Andrew W. Rudolph, Elmore, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed May 16, 1980, Ser. No. 150,329
Int. Cl.³ G01N *21/64*
U.S. Cl. 250—461 R **17 Claims**



1. A method of insuring that sheet articles having traces of fluorescent material deposited on one surface during their formation are oriented with said one surface in a prescribed direction as they advance along a conveyor, comprising the steps of

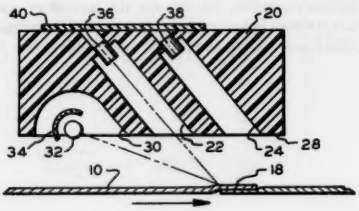
a. generating a signal in response to the arrival of each said sheet article at an inspection station along said conveyor;
b. utilizing said signal to initiate an inspection cycle including;
c. placing an ultraviolet light source in a delayed start mode;
d. checking a photocell positioned to receive fluorescent light from said sheet article for exposure to excess ambient light and activating an alarm in response to such excess light;
e. in the absence of excess ambient light, starting said ultraviolet source to expose the surface of said sheet article to ultraviolet light;
f. generating a signal from said photocell in response to fluorescent light from said surface, with no signal being generated in the absence of fluorescent light; and
g. utilizing the signal and lack of a signal from said photocell to differentiate between the two surfaces of said sheet article and activate an alarm to identify an improperly oriented sheet.

4,323,786

SEAM DETECTION AND CONTROL SYSTEM

David H. Snow, Jackson, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Jul. 3, 1980, Ser. No. 165,541
Int. Cl.³ G01N *21/86*
U.S. Cl. 250—559 **9 Claims**



1. A seam detection and control system for fabric processing apparatus processing a strip of moving fabric having spaced seams comprising, in combination, a detector located adjacent the moving fabric strip, sensing means mounted upon said detector producing first and second electronic signals upon a seam passing said detector separated by a time duration proportional to the velocity of movement of the seam past the detector, first fabric processing means processing the fabric at a predetermined location behind said detector with respect to the direction of fabric movement and having first and second processing conditions, first actuating means associated with said first fabric processing means selectively shifting said processing means between said first and second conditions, a first electronic timer connected to said sensing means and producing a first control signal having characteristics determined by the time duration between said first and second signals indicating the velocity of movement of the fabric, and a second electronic timer controlling the operation of said first actuating means between said first and second conditions producing a second control signal determined by the distance between said detector and said first fabric processing means receiving and evaluating said first control signal and energizing said actuating means upon a seam arriving at said first fabric processing means as determined by a comparison of said first and second control signals.

4,323,787

AUTOMATIC POWER SUPPLY APPARATUS

Tadashi Sato; Toyoji Hara, and Tadashi Tomita, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1979, Ser. No. 92,891
Claims priority, application Japan, Nov. 16, 1978, 53/156781[U]
Int. Cl.³ H02J *1/00*
U.S. Cl. 307—38 **2 Claims**

1. An automatic power supply apparatus for electrically connecting an electric power supply to a plurality of boxes including at least a cassette deck box; a tuner box and an audio box, which apparatus comprises:

an electric power supply line connected to an electric power supply;
a cassette responsive selector switch connected to said elec-

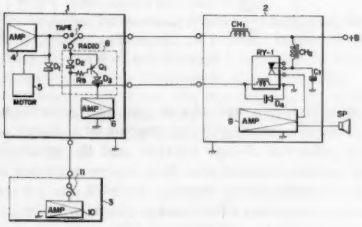
tric power supply line, said switch being located in said cassette deck box and being switched by loading of a cassette into said cassette deck box and by unloading of the cassette from such cassette deck box;

an automatic electric power supply circuit located within said cassette deck box, said circuit being connected to said cassette responsive switch and electrically energized thereby depending on the state of said cassette responsive switch;

a relay located within said audio amplifier box, said relay being connected to said automatic supply circuit to turn on said relay and thereby cause said relay to provide electric power from said power supply line to a circuit within said audio amplifier box in response to said cassette responsive switch being actuated to operate said automatic supply circuit; and

a manually operable switch located within said tuner box and connected between said automatic supply circuit and a circuit within said tuner box;

said automatic supply circuit including at least one transistor and a diode, said diode being coupled to said cassette responsive switch to turn on said transistor so as to provide said electric power to said relay and to a circuit within said cassette box when said cassette responsive switch is so actuated as to provide a forward voltage across the diode;



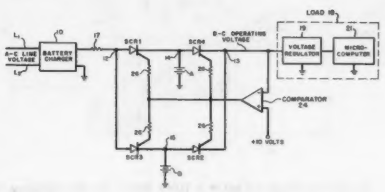
said cassette responsive switch being switchable between a tape operating terminal and a tuner operating terminal, said manually operable switch in said tuner box being connected in series with said tuner operating terminal of said cassette responsive switch through said diode, such that closure of said manually operable switch in said tuner box and switching of said cassette responsive switch to its tuner operating terminal are both required to turn on said transistor and thereby provided said electrical power to said relay and said circuit within said cassette deck box, the last-mentioned circuit being a control amplifier, a further diode connected between said tape operating terminal of said cassette responsive switch and a point at which said transistor applies said electric power to said control amplifier, said further diode being oriented to positively block electric current flow from said point back toward said tape operating terminal of said cassette responsive switch, said cassette deck box further including a tape pre-amp and cassette drive motor connected between said tape operating terminal of said cassette responsive switch and said further diode, such that said tape pre-amp and tape drive motor receive electric power only with said cassette responsive switch in its tape selecting position, and not from said transistor.

4,323,788

D-C POWER SUPPLY FOR PROVIDING NON-INTERRUPTIBLE D-C VOLTAGE

Edward M. Smith, Trumansburg, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 2, 1980, Ser. No. 193,313
Int. Cl.³ H02J 7/00
U.S. Cl. 307—66 **7 Claims**



1. A d-c power supply for providing a d-c operating voltage for powering a load, the magnitude of the operating voltage being held above a predetermined threshold level to maintain continuous uninterrupted operation of the load, said d-c power supply comprising:

a d-c power source for providing a d-c charging voltage;

first and second rechargeable batteries;

means, including a series-connected first SCR, for coupling said d-c power source to said first battery to charge said first battery;

means, including a series-connected second SCR, for coupling said second battery to the load to provide the required operating voltage for the load while said first battery is being charged;

means, including a series-connected third SCR, for coupling said d-c power source to said second battery, said third SCR being non-conductive while said first battery is being charged and when said second battery is supplying the operating voltage;

means, including a series-connected fourth SCR, for coupling said first battery to the load, said fourth SCR being non-conductive when said second battery supplies the operating voltage to the load;

and control means, responsive to the operating voltage, for turning on said third and fourth SCR's, and for turning off said first and second SCR's, when said second battery slowly discharges to the extent that the operating voltage drops to the predetermined threshold level, the charged first battery thereby being disconnected from the d-c power source and connected to the load to supply the required operating voltage while at the same time the discharged second battery is disconnected from the load and connected to the d-c power source for recharging.

4,323,789

SEQUENCER FOR POWER SUPPLY VOLTAGES

Donald F. Dion, Burlington, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,934
Int. Cl.³ H03K 17/60
U.S. Cl. 307—81 **7 Claims**

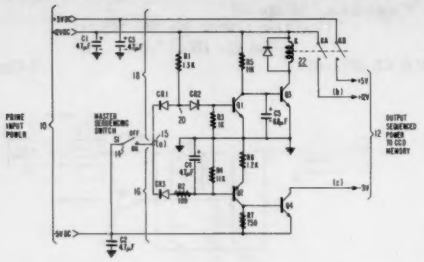
1. A sequencer for switching two power supply voltages on and off, comprising

a master on-off switch,

a first transistor switch circuit operated by said master switch and operative to switch one of said power supply voltages on and off, said first transistor switch circuit including a first capacitor to cause the circuit to respond after a time delay to the opening of said master switch, and

a second transistor switch circuit operated by said master switch and operative to switch the second one of said

power supply voltages on and off, said second transistor switch circuit including a second capacitor to cause the



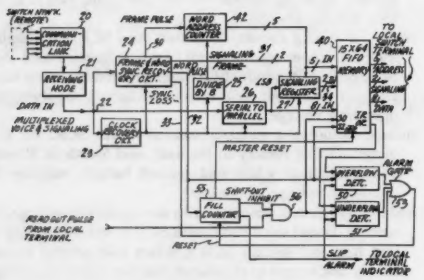
circuit to respond after a time delay to the closing of said master switch.

4,323,790

ELASTIC STORAGE AND SYNCHRONIZATION CONTROL APPARATUS FOR USE IN A TELEPHONE SWITCHING SYSTEM

Stephen C. Dunning, Cary, and Joseph E. Sutherland, Raleigh, both of N.C., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 5, 1980, Ser. No. 156,713
Int. Cl.³ H04J 3/07
U.S. Cl. 370—102 **12 Claims**



1. An elastic storage and synchronization apparatus for receiving a serial multiplexed signal of a given bit rate having a plurality of words, each of the same number of bits, with said words constituting a data frame having a fixed number of bits, comprising:

memory means having a plurality of addressable storage locations for storing at each location a given number of bits indicative of the number of bits in each of said words plus additional address bits manifesting the location of each of said words in said serial data stream,

timing means responsive to said multiplexed signal for providing clock pulses indicative of said given bit rate in said signal,

address access means coupled to said memory means and responsive to said clock pulses to provide at an output a plurality of unique address codes capable of accessing said memory means at each of said locations, to cause said memory means to store at each location said given number of bits,

capacity detecting means coupled to said memory means and operative to detect the magnitude of stored words in said memory means to determine a change in the rate of received data as compared to a desired rate, including means responsive to said change to clear all bits stored in said locations of said memory means, and

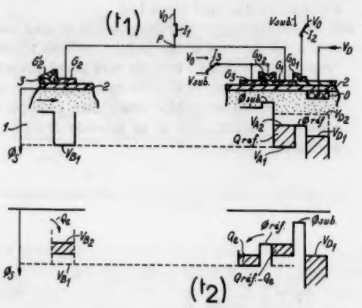
refilling means coupled to said capacity detecting means to fill a given number of said locations during a predetermined interval necessary to compensate for said change in rate.

4,323,791

SUBSTRACTION AND CHARGE QUANTITY GENERATION CHARGE TRANSFER DEVICE

Jean L. Berger, and Jean L. Coutures, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 29, 1980, Ser. No. 144,855
Claims priority, application France, May 4, 1979, 79 11315
Int. Cl.³ G11C 19/28; H01L 29/78
U.S. Cl. 307—221 D **5 Claims**



1. A subtraction and charge quantity generation charge transfer device ensuring the subtraction of n charge quantities from a reference charge quantity and the generation of a charge quantity equivalent to the n charge quantities and comprising a semiconductor substrate in which charges are stored, wherein it comprises a first storage electrode electrically connected at a point to n other storage electrodes, means ensuring the injection beneath the first storage electrode of the reference charge quantity prior to the arrival of the charges beneath the n storage electrodes and when the said point is at a constant voltage and means which maintain a constant surface potential beneath the first storage electrode during the arrival of the charges beneath the n storage electrodes and when the said point is left floating.

4,323,792

TWO TERMINAL CIRCUITRY FOR VOLTAGE LIMITATION

Günther Bergmann, Markbronner St. 20, Blaustein-Arnegg, Fed. Rep. of Germany (7906), and Arthur Kessler, Obererlenbacher St. 26, Friedrichsdorf, Fed. Rep. of Germany (6382)

Continuation of Ser. No. 858,046, Jun. 28, 1978, abandoned. This application Dec. 5, 1978, Ser. No. 966,689
Int. Cl.³ H03K 5/08
U.S. Cl. 307—549 **2 Claims**

1. A two terminal circuitry for voltage limitation having a blocked state and a conductive state, said circuitry comprising a solid state device having two electrodes, a controllable current path between said two electrodes, and an additional control electrode, said two electrodes being conductively connected to said additional control electrode, wherein the improvement comprises

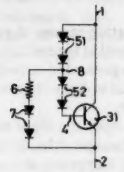
(a) a first shunt connecting said additional control electrode to one of said two electrodes of said solid state device;

(b) said first shunt having a tap dividing said first shunt into

a first shunt portion and a second shunt portion arranged in series with said first shunt portion;

(c) said first shunt portion including first diode means allowing current flow from said first shunt portion toward said tap;

(d) said second shunt portion including second diode means



allowing current flow in said second shunt portion toward said additional control electrode; and

(e) a second shunt connecting said tap to said other of said two electrodes, said second shunt including a series arrangement of resistor means and third diode means oriented to allow a current flow from said tap to said other of said two electrodes.

4,323,793

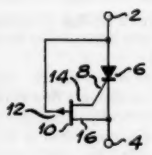
THYRISTOR HAVING WIDENED REGION OF TEMPERATURE SENSITIVITY WITH RESPECT TO BREAKOVER VOLTAGE

Herman P. Schutten, Milwaukee; Stanley V. Jaskolski, Sussex; Gordon B. Spellman, Mequon, all of Wis.; Robert W. Lade, North Fort Myers, Fla., and Michael J. Schutten, Milwaukee, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 946,180, Sep. 27, 1978, abandoned. This application Nov. 14, 1979, Ser. No. 94,074

Int. Cl.³ H03K *17/72*

U.S. Cl. 307—252 R **6 Claims**



1. An electronic device comprising the combination of:

a thyristor having at least (a) a gate and (b) main terminals including an anode and a cathode, said thyristor being of a type exhibiting a breakover voltage at which said thyristor intrinsically switches between nonconductive and conductive states upon application of at least said breakover voltage between said anode and cathode,

gate resistance means having resistance R between 10 kilohms and 1 megohm, connected between said gate and one of said main terminals, and adapted to increase and decrease its resistance R in response to increases and decreases respectively in amount of voltage V applied between said anode and cathode,

said thyristor moreover being of a type in which the value of said breakover voltage is responsive to both (1) the temperature Tsw of said thyristor at switching, said breakover voltage decreasing with increases in Tsw, and (2) the amount of said gate resistance R, said breakover voltage increasing with increases in gate resistance R;

whereby the value of said breakover voltage is only gradually responsive to temperature, so as to widen the region of temperature sensitivity of the device as a whole.

4,323,794

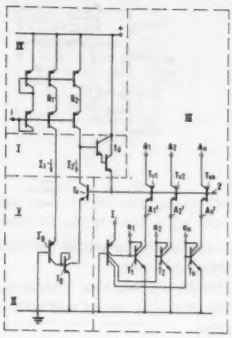
BIAS VOLTAGE GENERATOR FOR A MONOLITHIC INTEGRATED CIRCUIT

Wolfgang Hoehn, Kirchzarten, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jan. 30, 1980, Ser. No. 116,690

Int. Cl.² H03K *17/00*

U.S. Cl. 307—296 R **2 Claims**



1. A bias voltage generator having a plurality of I^2L current sources comprising;

a plurality of I^2L double-collector current source transistors, having uniform conductivity type and configuration,

a common injector connected to said I^2L double-collector current source transistors,

a plurality of bias voltage transistors having uniform conductivity type and configuration and each having its base connected to a single bias lead, each of said I^2L double-collector source transistors connected in series with one emitter of one bias voltage transistor,

a further bias voltage transistor of the same conductivity type and of the same configuration as said bias voltage transistors, having its base connected to said single bias lead,

a further I^2L double-collector current source transistor of the same conductivity type and of the same configuration as said I^2L double-collector current source transistors connected in series with the emitter of said further bias voltage transistor,

a further injector connected to the base of said further I^2L double-collector current source transistor,

a pluraity of current sources supplying equally high currents,

one said current source connected to said further injector and one said current source connected to the collector of said further bias voltage transistor,

a current mirror circuit comprising said further I^2L current source transistor, said further injector and said further bias voltage transistor,

a non-inverting amplifier connected between the collector and the base of said further bias voltage transistor supplying a current for balancing said current mirror circuit.

4,323,795

BIAS CURRENT NETWORK FOR IC DIGITAL-TO-ANALOG CONVERTERS AND THE LIKE

Peter R. Holloway, Andover, and Douglas A. Mercer, Bradford, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Filed Feb. 12, 1980, Ser. No. 120,891

Int. Cl.³ H03F *3/187*; H03K *13/25*

U.S. Cl. 307—297 **6 Claims**

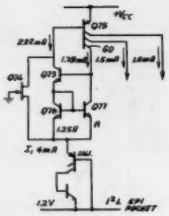
1. In an IC signal translation device such as a digital-to-

analog converter having a plurality of circuit sections requiring individual bias currents, a bias supply circuit comprising:

a PNP transistor with a split collector, said transistor being operated in high level injection;

means connecting one of said collectors and the base of said transistor to a current mirror;

control means responsive to the base current and the current



in said one collector for setting the current mirror ratio to a predetermined value;

means for combining said base current with said one collector current to supply one of said circuit sections with bias current; and

means connecting the other collectors of said transistor to said other circuit sections respectively, to supply them with their individual bias currents.

4,323,796

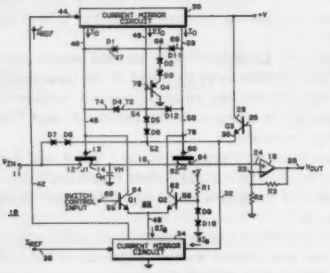
LOW TRANSIENT FEEDTHRU FET SAMPLE AND HOLD GATE

Michael F. Lathrope, Oak Forest, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 30, 1980, Ser. No. 116,739

Int. Cl.³ H03K *17/16, 17/687;* **G11C** *27/02*

U.S. Cl. 307—353 **4 Claims**



1. A low transient feedthru FET sample and hold switching circuit, having a supply voltage, and having an input terminal to which an input voltage is applied, comprising:

a. a switching FET, having a gate, and having a source and a drain coupled to a pair of terminals forming an input terminal and an intermediate terminal, said switching FET acting as a relatively high impedance between the input and intermediate terminals when it is in an OFF state and acting as a relatively low impedance between the input and the intermediate terminals when it is in an ON state;

b. means coupled to the intermediate terminal, for holding the voltage which is applied to the input terminal and coupled through the switching FET to the intermediate terminal when the FET is in the ON state;

c. means coupled to the intermediate terminal and to an output terminal, for tracking the voltage on the holding means and coupling the held voltage to the output terminal;

d. generating means, having a switch control input, and coupled to the tracking means and the FET gate, for generating a first switching voltage which is substantially equal to the held voltage and, for generating a second switching voltage which is substantially less than the supply voltage while sufficient to switch the FET to the OFF state, and

for switching said generating means, in response to a predetermined switching signal at the switch control input, such that the first voltage is generated to switch the FET to the ON state and the second voltage is generated to switch the FET to the OFF state;

e. diode means, coupled from the input terminal to the generating means, for maintaining the second switching voltage at a predetermined increment above the input voltage in response to the input voltage rising above the voltage on the holding means while the switching FET is in the OFF state.

4,323,797

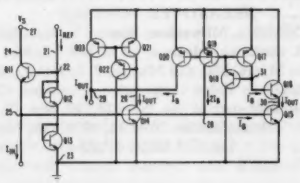
RECIPROCAL CURRENT CIRCUIT

Milton L. Embree, Reading, Pa., and William G. Garrett, Canton Township, Wayne County, Mich., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1980, Ser. No. 148,459

Int. Cl.³ G06G *7/12, 7/24*

U.S. Cl. 307—490 **2 Claims**



1. An electronic circuit having an output current which is the reciprocal of an input current comprising,

(a) a first terminal **13**,

(b) a reference current branch **11** connected to the first terminal **13** and containing a first node **12**,

(c) a pair of asymmetrically conducting semiconductor devices Q_2, Q_3 serially connected in the reference current branch **11** both poled for easy conduction in the same direction,

(d) an input current branch **14** including a first transistor Q_1 having its emitter and collector in said branch and including a second node **15** in the portion connected to the emitter,

(e) first interconnecting means coupling the base of the first transistor Q_1 to the first node **12** in the reference branch,

(f) an output current branch **16** including a second transistor Q_4 having its emitter and collector in said branch and having the portion connected to the emitter terminating at the first terminal **13**, and having the portion connected to the collector terminating at a second terminal **18**,

(g) second interconnecting means coupling the base of the second transistor to the second node **15** in the input branch **14**,

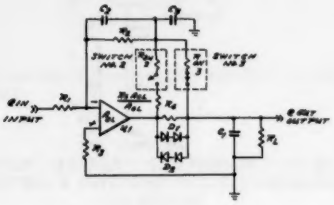
(h) circuit compensating means comprising (1) a counterpart output branch **30** connected in parallel with said output current branch and including current replicating means having an input connection from the base of the second transistor; (2) first current mirror means connected to the counterpart output branch and having a feedback connection to said input connection to the replicating means; (3) a corrected output terminal **29**; (4) second current mirror means connected between said output current branch and

the corrected output terminal; (5) a connection from the first current mirror to the corrected output terminal.

4,323,798
FAST OPERATING SWITCHABLE OPERATIONAL AMPLIFIER DRIVEN CIRCUITS

Grant H. Watkins, Upper Marlboro, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1980, Ser. No. 141,501
Int. Cl.³ H03B *1/03*; H03F *1/36*
U.S. Cl. 307—491 **8 Claims**



1. An electronic circuit that is switchable into and out of an electronic system comprising,

input means,

output means,

an operational amplifier having first and second inputs and an output, said first operational amplifier input connected through a first resistor to said input means,

an electrical component connected between the output of said operational amplifier and said output means,

a first capacitance means connected between said output means and ground,

a first feedback loop comprised of a second resistor and a first switch means connected in series between the output and the first input of said operational amplifier, and

a second feedback loop comprised of said second resitor and a second switch means connected in series between the first operational amplifier input and said output means, said first switch means being closed when said electronic circuit is switched into said electronic system and open when said electronic circuit is switched out of said electronic system, and said second switch means being open when said electronic circuit is switched into said electronic system and closed when said electronic circuit is switched out of said electronic system.

4,323,799
IMPULSE ACTIVATED TIME DELAY SELF-RESTORING SWITCH

William C. King, Chatham Township, Morris County, and Stephen Knight, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1979, Ser. No. 65,184
Int. Cl.³ H03K *17/687, 17/94*
U.S. Cl. 307—571 **13 Claims**

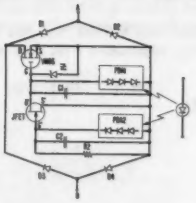
1. An impulse activated time delay self-restoring switch comprising:

a first field effect transistor (FET), said first transistor having source, gate and drain electrodes, said source and drain electrodes being connected to an electrical output circuit having first and second output terminals;

a light source, said light source being connected to an electrical input circuit;

a first series connected photodiode array, said array being optically coupled to said light source and connected to said field effect transistor whereby when said photodiode array is illuminated, said FET changes from an initial current conduction state to a complementary current conduction state; and

means for time delayed self-restoration from said complementary state to said initial state, said means being connected to said gate and source electrodes;

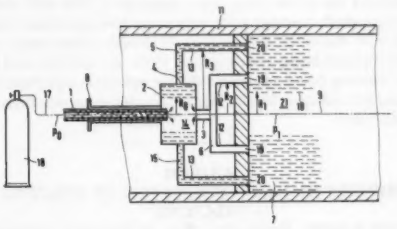


characterized in that said means comprises an RC timing network, said network comprising a parallel connected resistance and capacitance.

4,323,800
CONTROL OF COOLING OF SUPERCONDUCTING ROTOR

Albert Hofmann, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,402
Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918148
Int. Cl.³ H02K *9/00*
U.S. Cl. 310—52 **4 Claims**



1. In a method for effecting a self-regulating replenishment of helium from a reservoir into a helium pool in the superconducting rotor of a generator, in which helium in the pool boils at subatmospheric pressure, and a portion of the helium being transferred from the reservoir changes to the vapor phase, which method includes delivering both phases into the helium pool at a distance from the axis of rotor rotation, the improvement wherein said step of delivering comprises: separating the two phases of the helium from one another; and introducing the liquid and vapor phases separately into the pool at respectively different distances from the axis of rotor rotation, the liquid phase being introduced at a greater distance than the vapor phase from the axis, and the vapor phase being introduced into the pool at a distance from the axis of rotor rotation which is greater than that of the vapor/liquid interface in the pool.

4,323,801
BEARING SYSTEM FOR A ROTOR OF ELECTRIC MACHINES, ESPECIALLY FOR A ROTOR OF A TURBOGENERATOR WITH A SUPERCONDUCTIVE FIELD WINDING

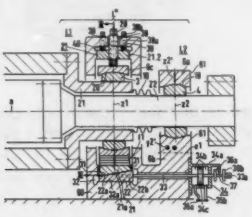
Erich Weghaupt, and Reinhold D'ham, both of Mulheim an der Ruhr, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed May 6, 1980, Ser. No. 147,153

Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918763

Int. Cl.³ H02K 9/00

U.S. Cl. 310—52 **8 Claims**



1. Bearing system for a rotor of an electric machine having an outer rotor part formed as a hollow cylinder and an inner rotor part disposed therewithin, the rotor having a drive side and an exciter side at opposite ends thereof, the inner rotor part being operatable in cryogenic temperature range and being fastened thermally insulatingly with respect to the outer rotor part, which is warmer relative to the inner rotor part, the inner rotor part being firmly flanged to the outer rotor part at the exciter side, the outer and the inner rotor parts having separate outer and inner coaxial shaft shanks supported so as to be movable thermally in axial direction independently of one another, an expansion compensator being disposed between the outer and the inner coaxial shaft shanks and serving also for sealing from the outside a hollow space formed between the inner and the outer rotor part, comprising first and second separate shaft bearings with respective bearing boxes associated with the outer and inner shaft shanks, respectively, said shaft bearings being axially spaced from one another, said first shaft bearing being adjustable during operation independently of said second shaft bearing for influencing vibration behavior of the rotor.

4,323,802
BUNDLE OF LAMINATIONS FOR AN ELECTRIC MACHINE

Werner Leistner, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 25, 1980, Ser. No. 133,959

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1979, 2912592

Int. Cl.³ H02K 9/00

U.S. Cl. 310—59 **12 Claims**

1. In a bundle of laminations for an electric machine, containing:

a plurality of stacks of laminations arranged in series in an axial direction;

at least two radial cooling channels arranged between said stacks and each extending in radial direction, said radial directions being arranged perpendicularly to said axial direction;

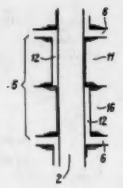
a plurality of slots extending along the surface of said bundle of laminations, each slot having two elongated lateral edges and a slot floor;

at least one electric conductor of a winding arranged in each of said slots;

the improvement comprising:

in each stack between two radial cooling channels a first group of series arranged laminations containing a first portion of one of said slots, the width of said first slot portion being greater than the width of said conductor arranged therein, said conductor and at least one lateral edge of said slot portion thereby forming a side duct for conducting a cooling medium therethrough; and

a recess at the floor of said first slot portion, said recess extending at least over a portion of said slot width and up to said one lateral edge, thereby forming a cooling channel which extends in an axial direction and opens at least on one side into one of said radial cooling channels.



4,323,803
ELECTRIC MACHINE

Vladimir G. Danko, bulvar Ivana, Karkacha, 2, kv. 89; Boris I. Ljuty, ulitsa Mira, 62, kv. 26; Alexandr A. Chigirinsky, ulitsa Kuibysheva 11, kv. 8; Vasily S. Kildishev, ulitsa Plekhanovskaya 41/43, kv. 55; Viktor V. Kuzmin, prospekt Gagarina, 92, kv. 43, all of, Kharkov; Yanush B. Danilevich, ulitsa Tipanova 29, kv. 681; Lidia I. Chubraeva, ulitsa Bestuzhevskaya, 34, kv. 55, both of Leningrad; Konstantin F. Potekhin, ulitsa Stanislavskogo, 11, kv. 186, Novosibirsk; Konstantin N. Maslennikov, ulitsa Petukhova, 138, kv. 87, Novosibirsk, and Valery K. Ivanov, ulitsa Zorge, 68, kv. 20, Novosibirsk, all of U.S.S.R.

Filed Mar. 31, 1980, Ser. No. 135,324

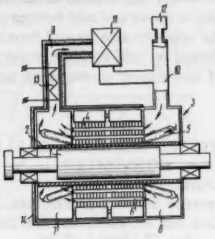
Claims priority, application U.S.S.R., Jun. 5, 1978, 2624805

Int. Cl.³ H02K 9/00

U.S. Cl. 310—59 **3 Claims**

1. An electric machine having a rotor and a stator circumferentially thereof, enclosure means enclosing the electric machine having a compartment divided by the stator into two chambers each on an opposite side of the stator, a jacket extending circumferentially about the rotor isolating the stator thermally from the rotor, said stator having means defining ducts therethrough for flowing a cooling fluid from one chamber to the other through the ducts in the stator, means for effecting a pressure differential of the cooling fluid in the two chambers as a function of a temperature differential and density of the cooling fluid in the two chambers comprising means defining an upward flow path for the cooling fluid above the level of said enclosure and in communication with one of said two chambers and a downward flow path for the cooling fluid

above the level of the enclosure, in communication with the other chamber, and a cooler in a flow path between the upward and downward flow paths for selectively cooling the cooling fluid.

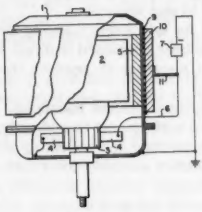


4,323,804

PERMANENT MAGNET FIELD MOTOR WITH RADIO FREQUENCY INTERFERENCE SUPPRESSING CAPACITOR

Edward J. Zelt, St. Marys, Pa., assignor to The Stackpole Corporation, St. Marys, Pa.

Filed Jul. 14, 1980, Ser. No. 168,071
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—72 **9 Claims**



1. A direct current permanent magnet field motor comprising an armature, permanent magnet fields encircling the armature and spaced therefrom, a commutator connected to one end of the armature for rotation therewith, a pair of brushes engaging the commutator, a pair of radially spaced substantially cylindrical metal members encircling said permanent magnet fields, a substantially cylindrical dielectric member between the two metal members, means for grounding one of said metal members and one of the brushes, and means for electrically connecting the other brush and the other metal member with a direct current power supply, whereby a capacitor is formed by said pair of metal members and said dielectric member for suppressing radio frequency noise generated by sparking of the brushes at said commutator.

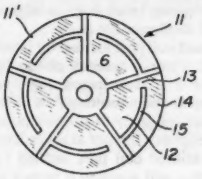
4,323,805

DIRECT CURRENT MICROMOTOR

Jean-Claude Caby, and Jean-Claude Girardin, both of La Chaux-de-Fonds, Switzerland, assignors to Portescap, La Chaux-de-Fonds, Switzerland

Filed Jun. 24, 1980, Ser. No. 162,483
Claims priority, application Switzerland, Jun. 25, 1979, 5511/79
Int. Cl.³ H02K *13/04*
U.S. Cl. 310—237 **3 Claims**

1. A direct current micromotor which comprises a stator having a fixed magnetic circuit, and an iron-free rotor comprising a coil support substantially in the form of a disc and a cylindrical coil fixed at one of its ends to the periphery of the said support, the coil support comprising collector segments and means for connecting the segments to respective portions of the coil, and the stator comprising commutator brushes arranged to co-operate with the said collector segments, wherein the coil support comprises a printed circuit board having an annular radially inner zone in which circular sectors of conducting material are formed and constitute the collector segments, the latter segments having a radial extension which extends to the periphery of the support, the printed circuit board further having a peripheral annular zone in which peripheral sectors of conducting material are formed and cover the greater portion of said peripheral zone, at least the sectors of a first group of peripheral sectors being separated in the radial direction, from the collector segments, by way of an insulating zone, at least the sectors of a second group of peripheral sectors being part of the said radial extensions of the collector segments, the wire ends of the various portions of the coil being connected to at least one portion of the peripheral sectors.

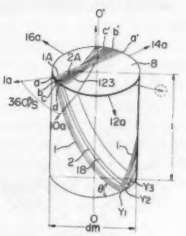


4,323,806

MINIATURE ROTARY ELECTRIC MACHINE

Kanemasa Aoki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,558
Claims priority, application Japan, Nov. 2, 1978, 53/135205
Int. Cl.³ H02K *1/22*
U.S. Cl. 310—266 **2 Claims**



1. A rotary coil for use in a coreless motor comprising:

(a) a plural number of first coil groups including

a first inclined coil part formed by winding a wire conductor for a rotary coil of said coreless motor in such manner that, to form a coil body in a shape of cup with one open end and another closed end constituted of an end connection part being a portion of said rotary coil, a winding extends obliquely from one point on one edge of a cylindrical circumferential surface of said coil body to another thereof at a predetermined inclination relative to a generatrix of said coil body,

a second inclined coil part formed by winding said wire conductor in such manner that said winding is turned back at a position in the vicinity of said open end and extends obliquely toward an edge nearly opposed to

said one edge of said cylindrical circumferential surface of said coil body, and

an end connection part for making a connection of said inclined coil parts across the area of the end surface of said cup-shaped body, and formed by winding said inclined coil parts and an end connection part a plural number of times at the same position in layer with the same number of turns so as to form said cup-shaped rotary coil;

(b) a plural number of second coil groups including

a transition part for changing the winding direction of each coil group relative to an adjacent one by a predetermined displacement angle,

a first inclined coil part formed by winding in such manner that said winding extends obliquely from a point displaced by a predetermined angle relative to said first coil group at said transition part along the upper periphery of said coil body to another point on an edge of the lower periphery thereof at a predetermined inclination,

a second inclined coil part formed by winding in such manner that said winding is turned back at a position in the vicinity of said open end of said coil body and said winding extends obliquely toward and edge nearly opposed to said one edge of the cylindrical circumferential surface of said coil body, and

an end connection part for making a connection of said inclined coil parts across the area of the end surface of said cup-shaped coil body, and formed by winding said inclined coil parts and said end connection part a plural number of times at the same position in layer with the same number turns so as to form said cup-shaped rotary coil; and

(c) a lead wire part formed as a portion of said transition part and brought out from said winding at the transition from one of said coil groups to an adjacent one to connect to a commutator for supplying power to said rotary coil.

4,323,807

LOCK STRUCTURE FOR INTEGRATING A CABINET COVER AND A BOTTOM PLATE

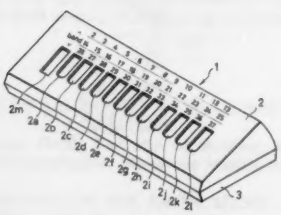
Shigekata Sugiura, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,192

Claims priority, application Japan, Sep. 4, 1979, 54/122194

Int. Cl.³ A47B *81/06*; E05F *1/00*; B65D *45/00*

U.S. Cl. 312—284 **3 Claims**



1. In a lock structure for integrally locking a cabinet cover to a bottom plate, including first and second sets of co-engaging structures, said first set of co-engaging structure being at least constituted by a concavity and a corresponding covexity each formed on the inner surface of one of said cabinet cover and a facing inner surface of said bottom plate, respectively, said second co-engaging structure being at least constituted by a resilient anchor pawl having at the tip thereof a hook and a resilient latch member having at the center thereof an anchor hole to engage with said hook formed on the inner surface of said cabinet cover and a facing inner surface of said bottom plate, respectively, the improvement comprising a rod-like projection being formed adjacent to said anchor pawl so as to face respective one of said latch member when said second structure is co-engaged and, a gap being defined between said latch members and one frame side wall of said cabinet cover or said bottom plate for receiving said anchor pawl and said rod-like projection when said second structure is co-engaged and, when said cabinet cover and said bottom plate are opened on hinges from the opposite side to said frame side wall, said latch member is flexed by said rod-like projection thereby to release the lock of said second co-engaging structure.

4,323,808

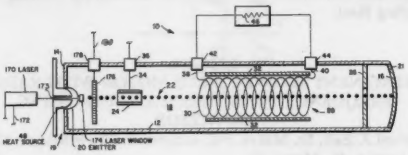
LASER EXCITED THERMIONIC ELECTRIC CONVERTER

Edwin D. Davis, Daytona Beach, Fla.

Continuation-in-part of Ser. No. 33,025, Apr. 24, 1979. This application Jul. 17, 1980, Ser. No. 169,799

Int. Cl.³ H01J *45/00*

U.S. Cl. 310—306 **7 Claims**



1. Apparatus for converting heat and light energy directly into electrical energy comprising:

(a) a cathode element having an electron emissive surface for emitting electrons in response to the application of heat energy to said surface;

(b) a grid for selectively trapping said electrons;

(c) a pulse laser positioned to direct a laser beam toward the trapped electrons to convert the electrons to electron boluses;

(d) a collecting element maintained at a positive electrical potential with respect to said cathode element for attracting, accelerating and collecting said electron boluses;

(e) an induction assembly comprised of a helical coil having a longitudinal axis and means for producing a stationary transversely oriented magnetic field in the interior region of said coil;

(f) an evacuated elongated container for fixedly housing said cathode element at a first end, and said collecting element at a second end, and said induction assembly at an intermediate location therein;

(g) whereby said electron boluses in accelerated transit towards said collecting element are caused to pass through said coil interior region therein individually exhibiting an oscillatory magnetic field action thus giving rise to an induced EMF in said coil.

4,323,809

SURFACE ACOUSTIC WAVE SUBSTRATE HAVING ORTHOGONAL TEMPERATURE COMPENSATED PROPAGATION DIRECTIONS AND DEVICE APPLICATIONS

Robert M. O'Connell, Columbia, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 19, 1979, Ser. No. 105,362

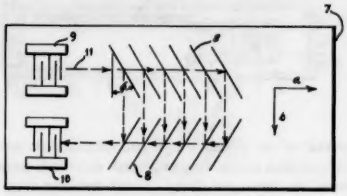
Int. Cl.³ H01L *41/08*

U.S. Cl. 310—313 A **2 Claims**

1. A reflective grating surface acoustic wave device comprising

a substrate member having a surface acoustic wave propagating surface and an equal temperature coefficient of delay in two non-parallel directions on said propagation surface, said substrate member comprising a single crystal quartz member having an acoustic surface wave propagation surface defined by a plane that substantially coincides

with the Euler angles Lambda=0.0°, mu=125.87 (+1−6)°, Theta=45/0°,
an input transducer on said propagation surface,
an output transducer on said propagation surface, and

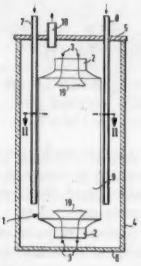


reflective grating means on said propagation surface, the principal and secondary axes of propagation of said device being aligned with equal temperature coefficient of delay directions.

4,323,810
IRRADIATION APPARATUS INCLUDING A LOW-PRESSURE MERCURY LAMP WITH FLUID MEDIUM DUCT MEANS

Georg Horstmann, Gerbelstr. 19, 4902 Bad Salzuflen, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,772
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1978, 2825018
Int. Cl.³ H01J *61/33, 61/52*
U.S. Cl. 313—24 **9 Claims**

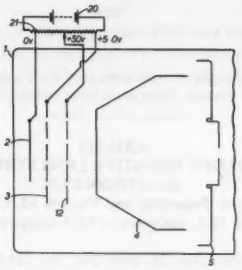


1. Irradiation apparatus including a low-pressure mercury lamp suitable for photochemical disinfecting and sterlization, said lamp including a lamp tube having a flat, elongated cross-section and including electrodes extending along the width direction of said lamp tube, wherein the improvement in said irradiation apparatus comprises:
an outer enveloping tube substantially surrounding said lamp tube in spaced relation thereto and having a shape substantially conforming to the shape of said lamp tube; and
duct means passing through said enveloping tube and formed and positioned along the narrow sides of said lamp tube for the discharge and withdrawal of a fluid medium into the space between said lamp tube and said enveloping tube along said narrow sides.

4,323,811
STREAKING IMAGE TUBE WITH CLOSELY SPACED PHOTOCATHODE, SUPPRESSOR MESH, AND ACCELERATOR MESH

Brian R. C. Garfield, Essex, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Continuation of Ser. No. 885,192, Mar. 10, 1978, abandoned, which is a continuation of Ser. No. 599,465, Jul. 28, 1975, abandoned. This application Oct. 29, 1979, Ser. No. 89,205
Claims priority, application United Kingdom, Aug. 3, 1974, 34304/74
Int. Cl.³ H01J *31/26, 39/04*
U.S. Cl. 313—99 **7 Claims**



1. In a streaking image tube of the type including photocathode means for receiving light images of picosecond duration and converting them to photoelectrons, accelerating mesh electrode means immediately adjacent said photocathode means for accelerating the photoelectrons away from the photocathode means, anode means spaced from said accelerating mesh electrode means for passing said photoelectrons therethrough, a screen for receiving said photoelectrons, and deflection means disposed between said anode means and said screen for deflecting said photoelectrons normally to their direction of movement to form a streak image on said screen, the improvement wherein:
the spacing of said accelerating mesh electrode from said photocathode is in the range 0.5 mm to 1 mm, and wherein further mesh electrode means is provided immediately adjacent said accelerating mesh electrode means at a spacing of 1.5 to 3.0 mm therefrom, and between the same and said anode means for causing secondary electrons produced by said accelerating mesh electrode means and/or spurious photoelectrons caused by light energy passing through said photocathode means to be attracted to said accelerating mesh electrode means, whereby to enhance the quality of said streak image.

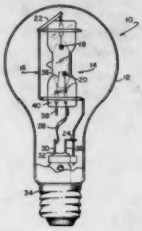
4,323,812
ELECTRIC DISCHARGE LAMP

Elliot F. Wyner, Peabody, Mass., and Elvery D. Lowry, Hillsboro, N.H., assignors to GTE Service Corporation, Stamford, Conn.

Filed Mar. 7, 1980, Ser. No. 127,720
Int. Cl.³ H01J *61/54*
U.S. Cl. 313—198 **4 Claims**

1. In a high pressure electric discharge lamp including an outer envelope containing an inert atmosphere, an arc discharge tube mounted within said outer envelope, said arc discharge tube containing first and second spaced apart main electrodes and an ionizable medium, the improvement comprising: means within said lamp for reducing the starting voltage of said lamp by an average of about 50% after said lamp has aged about 4000 hours, said means comprising at least one starting probe positioned in said arc tube, said starting probe

being adjacent only one of said main electrodes, and being electrically isolated at all times from any ohmic contact with



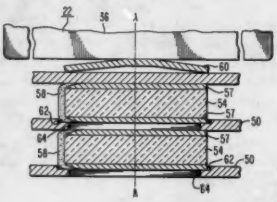
any other electrode of said lamp and from any ohmic contact or capacitive contact from associated ballast circuitry.

4,323,813

SPRING-LOADED RESISTIVE LENS STRUCTURE FOR ELECTRON GUN

Leon J. Vieland, Princeton, and Vincent M. Cannuli, Mercerville, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 23, 1980, Ser. No. 114,514
Int. Cl.[3] H01J *1/88, 19/42*
U.S. Cl. 313—250 **7 Claims**



1. An electron gun comprising a cathode and two apertured terminal lens electrodes mounted in fixed relationship axially along a plurality of glass support rods, and a resistive lens stack disposed between said terminal electrodes and mechanically and electrically secured thereto, said resistive lens stack comprising a plurality of apertured electrode plates alternately stacked with a plurality of resistive spacer blocks, and spring means contacting said stack and axially urging said electrode plates and said resistive blocks into mutual electrical contact with each other and with said terminal electrodes, whereby said stack has a highly resistive electrically continuity from one of said terminal electrodes to the other of said terminal electrodes.

4,323,814

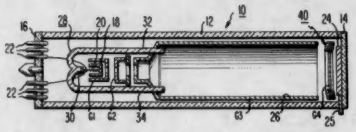
MESH ASSEMBLY HAVING REDUCED MICROPHONICS FOR A PICK-UP TUBE

Timothy E. Benner, and Alfred Month, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 16, 1980, Ser. No. 150,341
Int. Cl.[3] H01J *29/02, 29/08*
U.S. Cl. 313—390 **7 Claims**

1. In a pick-up tube having a generally cylindrical envelope, a faceplate at one end of said envelope, a photoconductive target electrode adjacent to said faceplate, a cathode in the other end of said envelope and a mesh assembly disposed in spaced relation adjacent to said target electrode, between said target electrode and said cathode, the improvement wherein said mesh assembly comprises:

a mesh electrode disposed between a frustro-conically shaped mesh support ring and a dished, spring-like mesh damping ring, said mesh damping ring being fixedly attached at a plurality of spaced points around its outer periphery to said mesh electrode and said support ring, whereby said mesh damping ring is compressed into a



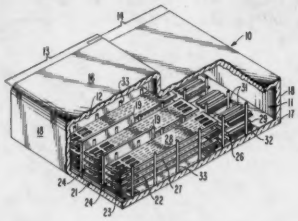
reversal of its dished shape and assumes an undulatory configuration contacting said mesh electrode periodically around the inner periphery of said damping ring, thereby retaining said mesh electrode with reduced microphonics.

4,323,815

UNITARY BEAM GUIDE/ELECTRON GUN ASSEMBLY FOR FLAT PANEL DISPLAY DEVICES

John P. Russell, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 29, 1980, Ser. No. 125,823
Int. Cl.[3] H01J *29/02*
U.S. Cl. 313—422 **4 Claims**



1. In a flat panel display device including a beam guide along which electrons propagate as beams, a cathode, and modulation means for modulating said electrons, a unitary beam guide/electron gun assembly comprising:

at least two guide meshes arranged in a parallel and spaced relationship to form at least one space along which said electrons propagate, at least a portion of said modulation means and a portion of said guide meshes overlapping in a parallel and spaced relationship, said modulation means including insulative modulator supports arranged on opposite sides of and substantially equally spaced from said cathode and modulation electrodes affixed to said supports;

at least one additional electrode parallel to and spaced from said guide meshes and at least a portion of said modulation means;

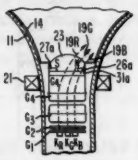
additional insulative support means for supporting said cathode along the plane of the center of said space; and

spacer means for maintaining said beam guides, said modulation supports, said additional insulative support means and said additional electrode in said spaced and parallel relationships, said spacer means being spaced along the length of said beam guide/electron gun assembly.

4,323,816
SYSTEM FOR ENHANCING DEFLECTION IN KINESCOPES

Kern K. N. Chang, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 30, 1980, Ser. No. 154,835
Int. Cl.³ H01J *29/72, 29/80*
U.S. Cl. 313—433 **4 Claims**



1. In a post-deflection acceleration kinescope including an evacuated envelope having a funnel portion, a neck portion, a screen hermetically affixed to the wide end of said funnel portion, and a conductive coating on the inside surface of said funnel portion, an electron gun for providing at least one electron beam arranged in said neck portion, and a deflection yoke for horizontally and vertically deflecting said electron beam so that said screen is scanned with said electron beam, a deflection system for enhancing said horizontal and vertical deflection comprising:

an electrostatic lens including said conductive coating and planar plates with curved edges on the screen side arranged parallel to the direction of said horizontal scanning and equally spaced about the center of said neck portion so that said electron beam passes between said plates and is horizontally unaffected by said electrostatic lens;

a quadrupole lens in combination with said electrostatic lens said quadrupole having an internal defocusing action acting in the direction of said vertical deflection and an internal focusing action acting in the direction of said horizontal deflection, and having a first pair of poles of said quadrupole arranged to produce a first magnetic field extending substantially parallel along the plane of one said plates and outwardly past the curved end of said plate, a second pair of poles of said quadrupole being arranged to produce a second magnetic field extending substantially parallel along the plane of another of said plates and outwardly past the curved end of said another plate so that electron beams exiting from said plates are deflected away from the center line of said kinescope by one of said magnetic fields, and

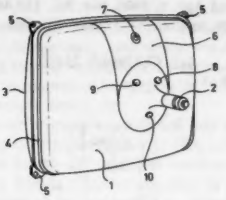
first low reluctance means arranged between the poles of said first pair to provide a first low reluctance return flux path and second low reluctance means arranged between the poles of said second pair to provide a second low reluctance return flux path so that the vertical and horizontal deflections of an electron beam are enhanced upon leaving said quadrupole and are unaffected while passing between said plates.

4,323,817
COLOR DISPLAY TUBE

Johannus A. Vennix, and Cornelis Stapel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1979, Ser. No. 102,202
Claims priority, application Netherlands, Jan. 26, 1979, 7900623
Int. Cl.³ H01J *29/70*
U.S. Cl. 313—440 **9 Claims**

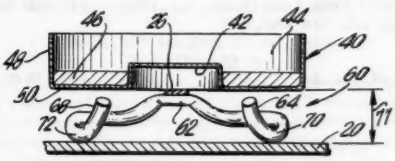
1. A colour display tube comprising a glass envelope including a display window, a cone and a neck, which envelope is provided, in the neck-cone transition part, with a number of reference studs on the outside of the envelope to adapt the tube for placement of a system of deflection coils thereon, characterized in that each reference stud consists of non-ferromagnetic material, and at least the side of the stud which is secured against the glass envelope consists of stainless steel, titanium or a titanium alloy.



4,323,818
GETTER CONSTRUCTION FOR REDUCING THE ARC DISCHARGE CURRENT IN COLOR TV TUBES

Thomas H. Madden, Euclid, and Clair W. Reash, Fairview Park, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 967,355, Dec. 7, 1978. This application Feb. 9, 1981, Ser. No. 232,960
Int. Cl.³ H01J *29/94*
U.S. Cl. 313—481 **1 Claim**

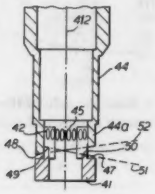


1. A getter assembly for a cathode ray tube having a funnel portion with a high resistance coating thereon of the order of 2,000 to 6,000 ohms per square to reduce arc current magnitude, said getter assembly being directly connected electrically to the electron gun of a cathode ray tube and comprising a cylindrically shaped metal receptacle having an open top; a side wall member; an upraised bottom portion which with said wall member defines in said receptacle an annular channel having a floor member, the height of said side wall member with respect to said floor member being about 2 times greater than the height of said upraised bottom portion; getter material within said annular channel; a wire support member depending from the bottom of said receptacle the ends of said wire support being bent inwardly toward each other, first downwardly and then upwardly to form two spaced apart curved bases for contacting the resistance coating on the funnel portion of said cathode ray tube, said curved bases being entirely located beneath said floor member and spaced inwardly from said side wall member toward said upraised portion and being located about 0.130 to 0.155 inch from said floor member whereby short circuiting of the resistive coating due to flashing of the getter is avoided.

4,323,819
SPIN-TUNED MAGNETRON

Alan B. Cutting, Maidenhead, England, assignor to E M I - Varian Limited, Hayes, England

Filed Apr. 8, 1980, Ser. No. 138,445
Claims priority, application United Kingdom, May 1, 1979, 15145/79
Int. Cl.³ H01G 25/50
U.S. Cl. 315—39.61 10 Claims

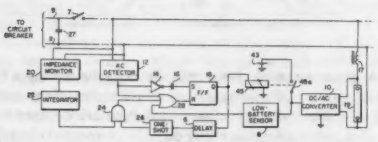


1. In a spin tuned magnetron including:
a spinner rotatable about an axis of rotation,
anode vanes,
an anode vane ring supporting the anode vanes, the ring having an annular flange extending parallel to the axis,
the spinner having a cylindrical portion which overlaps the anode vanes and which is disposed radially outwardly of the flange,
the improvement wherein axially facing end surfaces of the said cylindrical portion of the spinner and the flange lie in respective planes inclined relative to a reference plane perpendicular to the said axis.

4,323,820
EMERGENCY LIGHTING SYSTEM

Rudor M. Teich, South Orange, N.J., assignor to Foxmar Industries Inc., New York, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,650
Int. Cl.³ H02J 9/00
U.S. Cl. 315—86 48 Claims

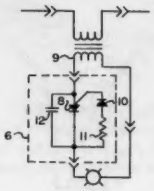


1. A system for controlling the operation of an emergency device connected to a power line having a switch therein comprising a secondary power source for powering said emergency device, means for detecting a first loss-of-power condition resulting from the opening of said switch and a second loss-of-power condition resulting from a line failure even when said switch is closed, means responsive to the detection only of said second condition for enabling the continued powering of said emergency device from said secondary power source, said secondary power source, said detecting means and said enabling means all being contained at the location of said emergency device, control means for initially causing said emergency device to be powered from said secondary power source immediately responsive to the loss of power on said power line, and means for controlling said enabling means to operate only a predetermined time interval after said loss of power.

4,323,821
LUMINAIRE CONVERTER

Thomas J. Day, Jefferson City, Mo., assignor to Central Electrical Company, Fulton, Mo.

Filed Jan. 30, 1980, Ser. No. 116,966
Int. Cl.³ H05B 39/10, 41/46
U.S. Cl. 315—87 10 Claims

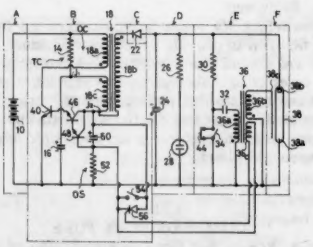


1. A converter circuit for use in changing a series wired primary ballast for a mercury vapor lamp circuit to one that can accommodate a high intensity discharge lamp in the category of a high pressure sodium lamp, and therein achieve substantial energy savings during operation of the said high pressure sodium lamp over the corresponding energy consumed during operation of the replaced mercury vapor lamp, comprising, a secondary circuit for the said ballast and having a lamp retaining socket also connected therein, a silicon controlled rectifier connected within the secondary circuit and useful for generating a direct current electrical pulse necessary for energization of such a high intensity discharge lamp, a trigger diode connecting with the gate of the said rectifier and when current conducting providing for a charging of the said rectifier, and a resistor series connected with the said trigger diode and useful for regulating the size of lamp to be accommodated by the converter circuit.

4,323,822
ELECTRIC FLASH DEVICE

Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan

Filed Sep. 22, 1978, Ser. No. 944,893
Claims priority, application Japan, Sep. 25, 1977, 52-128649[U]; Oct. 22, 1977, 52-142363
Int. Cl.³ H05B 41/32
U.S. Cl. 315—241 P 16 Claims



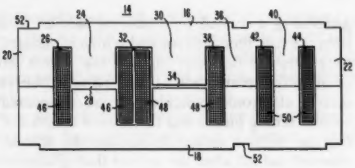
1. An electric flash device comprising a direct current power source circuit including a direct current power source for providing a direct current voltage, a flash tube circuit including a flash tube, a voltage converter circuit for converting said direct current voltage of said direct current power source to an alternating current voltage, a rectifier circuit for rectifying said alternating current voltage to a direct current voltage, a charging circuit for storing an electric charge and for supplying electrical energy to said flash tube, and a trigger pulse generating circuit for triggering said flash tube of the flash tube circuit,

said voltage converter circuit comprising an oscillating transformer connected to said direct current power source for generating a high alternating current voltage and having a current flowing therein, an oscillator circuit for performing an oscillating operation including an oscillating switch element having a high leakage resistance for switching said current which flows in said oscillating transformer and functioning as a high resistance resistor when the oscillating operation of said oscillator circuit ceases, said oscillating switch element including a control electrode circuit, and an oscillation starting circuit including a switching means, provided in said control electrode circuit of said oscillating switch element of said oscillator circuit, for turning on said oscillating switch element of said oscillator circuit.

4,323,823
UNITARY BALLAST STRUCTURE FOR OPERATING FOUR FLUORESCENT LAMPS

Rao L. Boggavarapu, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 16, 1980, Ser. No. 150,480
Int. Cl.³ H05B *41/23*
U.S. Cl. 315—254 **6 Claims**



1. A unitary ballast structure for starting and operating four fluorescent lamps, said ballast structure comprising stacked magnetic iron laminations and insulated coils retained thereon to provide as electrical components two separate inductor means and lamp electrode-coil-heating transformer means, with minimized magnetic coupling between different ones of said electrical components, said unitary structure comprising:

(a) a composite unitary magnetic core member formed of stacked magnetic iron laminations and having a shell-type configuration with two main leg members and six coil leg members which together define five wire-coil-receiving windows;

(b) said coil leg members including first and sixth coil leg members projecting respectively from the extremities of each said main leg member to form a continuous magnetic path about the periphery of said shell-type core;

(c) said coil leg members including a second coil leg member spaced by a predetermined distance from said first coil leg member to form a first inductor means coil-receiving window of predetermined dimensions, and said second coil leg member including therein an air gap of predetermined dimensions;

(d) said coil leg members including a third coil leg member spaced by a predetermined distance from said second coil leg member to form a second inductor means coil-receiving window of approximately double the size of said first coil-receiving window, and said third coil leg member including therein an air gap of predetermined dimensions;

(e) said coil leg members including a fourth coil leg member spaced from said third coil leg member by a predetermined distance to form a third coil-receiving window approximately the same size as said first coil-receiving window;

(f) said coil leg members including a fifth coil leg member spaced predetermined distances intermediate said fourth coil leg member and said sixth coil leg member to form fourth and fifth coil-receiving windows of predetermined dimensions;

(g) an insulated wire coil retained on second coil leg member to occupy said first window and approximately half said second window and terminating in a pair lead-in wires adapted to be connected in circuit to form a first inductor means;

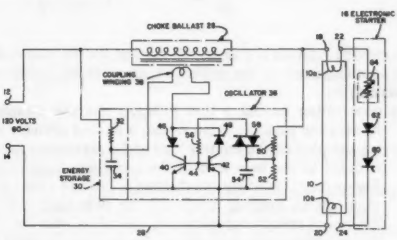
(h) an insulated wire coil retained on said third coil leg member to occupy said third window and the remaining half of said second window and terminating in a pair of lead-in wires adapted to be connected in circuit to form a second inductor means; and

(i) a transformer primary winding coil and multiple secondary winding coils retained on said fifth coil leg member to occupy said fourth and said fifth windows, and each said transformer winding coil terminating in separate lead-in wires adapted to be connected in circuit; whereby the physical separation of said first and said second inductor means and said transformer means minimizes magnetic coupling therebetween while still providing a compact unitary structure.

4,323,824
LOW VOLTAGE FLUORESCENT OPERATING CIRCUIT

William J. Roche, Merrimac, and Carlo S. Bessone, Woburn, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 21, 1979, Ser. No. 106,171
Int. Cl.³ H05B *37/00, 39/00*
U.S. Cl. 315—289 **21 Claims**



1. A circuit for starting and operating a fluorescent lamp from a source of AC line voltage comprising, in combination:

first and second input terminals for connection across said source of line voltage, and first and second output terminals for connection across said lamp;

a choke ballast series connected between said first input terminal and said first output terminal;

a common conductor connected between said second input terminal and said second output terminal;

energy storage means connected between said first and second input terminals;

a voltage sensitive relaxation oscillator connected between said first output terminal and said common conductor; and

means connected between said energy storage means and said oscillator including a winding for inductively coupling pulses to said choke ballast, said oscillator being operative during the process of starting said lamp to repeatedly switch said storage means across said coupling winding to provide a pulse train therefrom during a half cycle of said line voltage.

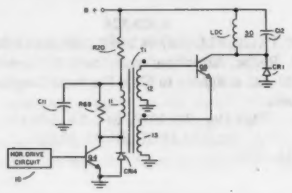
4,323,825
DEFLECTION SYSTEM WITH POSITIVE FEEDBACK

Robert S. Hayes, Pasadena, Calif., assignor to Mohawk Data Sciences Corp., Parsippany, N.J.

Filed Oct. 6, 1980, Ser. No. 193,989
Int. Cl.³ H01J *29/70, 29/72*
U.S. Cl. 315—387 **2 Claims**

1. In an electron beam deflection circuit which is coupled to

a source of operating energy and which is responsive to a source of periodic drive signal to provide a periodic sawtooth current in a deflection coil, each period of the signal having a retrace interval and a scanning interval, the sawtooth current having a substantially linear ramp during the scanning intervals thereby storing energy in the deflection coil, the deflection circuit including a switching transistor having its base lead coupled to respond to the periodic drive signal and having its collector lead connected in circuit with a tank network, the tank network including the deflection coil and a damping diode; the circuit operation being such that during the retrace intervals the transistor is cut off and the damping diode becomes forward biased after the stored energy completes about one-half cycle of an oscillation in the tank network and continues to be forward biased to damp such oscillation and to complete a current path for the sawtooth current until approximately the midpoint of the ensuing scanning interval when the forward bias of the diode is removed and the collector to emitter path of the switching transistor thereafter completes



the current path for the sawtooth current for the remainder of the scanning interval; the deflection circuit being further characterized by;

a transformer having a first primary winding coupled to receive the periodic drive signal, a second primary winding coupled to the emitter lead and a secondary winding coupled to the base lead of the switching transistor; the first primary winding conducting a current pulse during each retrace interval to cut off the switching transistor, the stored energy decaying and providing base current to the switching transistor during the first half of each scanning interval, the second primary winding providing base current during the second half of each scanning interval; and by

the transformer coupling between the switching transistor base and emitter leads providing positive feedback so as to control the base current for the switching transistor throughout the time that the switching transistor is conducting.

4,323,826

DRIVE CIRCUITS FOR A HIGH RESOLUTION CATHODE RAY TUBE DISPLAY

Frederick D. Lehman, Rockford, Minn., assignor to CPT Corporation, Eden Prairie, Minn.

Division of Ser. No. 896,81 3, Apr. 17, 1978, Pat. No. 4,238,774. This application Dec. 17, 1979, Ser. No. 103,999

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—408 **13 Claims**

1. A high frequency two way scan circuit for causing trace and retrace scans on a cathode ray tube having a yoke comprising:

sweep means connected to the yoke of the cathode ray tube for causing the trace to sweep from a first side of the tube to the other;

receiving means for receiving a retrace sync signal;

first circuit means connected to the sweep means for turning the sweep means off during retrace comprising:

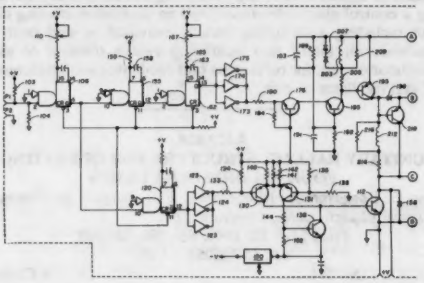
first timing means connected to the receiving means for generating a first timing interval during which the sweep means will be off;

electronic switching means connected to the first timing means and the sweep means for switching the sweep means off during the first timing interval and on after the timing interval established by the first timing means;

retrace means connected to the yoke of the tube for causing the trace to return to the first side of the tube; and

second circuit means connected to the retrace means for turning the retrace means on comprising:

second timing means connected to the receiving means for



generating a second time interval smaller in duration than the first time interval and which is initiated a finite time after the first time interval and which terminates prior to the termination of the first time interval; and

a second electronic switching circuit connected to the second timing means and the retrace means for switching the retrace means on during the second timing interval and off after the second timing interval.

4,323,827

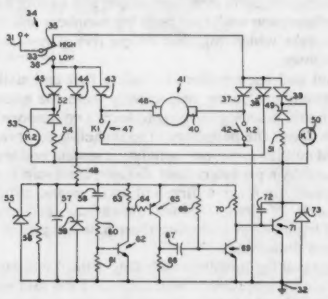
APPARATUS FOR CONTROLLING A TWO-SPEED SHIFT MOTOR

Richard N. Young, and James A. Williams, both of Richmond, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Aug. 6, 1980, Ser. No. 175,838

Int. Cl.³ H02K *7/14*

U.S. Cl. 318—3 **13 Claims**



1. In an electrically actuated shift apparatus for a multi-speed axle including an electric power source and an electric motor coupled to actuate means for shifting the axle, a control means comprising:

means for generating a shift signal;

means responsive to said shift signal for generating a first control signal for a first predetermined time;

means responsive to termination of said first control signal for generating a second control signal for a second predetermined time; and

means responsive to said second control signal for connecting the power source to the motor for said second prede-

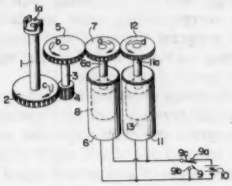
termined time to shift the axle from one speed to another speed.

4,323,828

APPARATUS FOR USE WITH A MOTOR DRIVE

Katumi Terada, and Kazuyuki Nemoto, both of Hachioji, Japan, assignors to Olympus Optical Co. Ltd., Japan

Continuation-in-part of Ser. No. 807,396, Jun. 17, 1977, Pat. No. 4,219,764. This application May 4, 1979, Ser. No. 36,071
Claims priority, application Japan, Jul. 9, 1976, 51-92171
Int. Cl.³ H02P *1/54*
U.S. Cl. 318—45 **9 Claims**



1. Apparatus for use with a motor drive comprising:

a pair of motors each having a cooperating stator and rotor and an output shaft operatively driven by said rotor:

the moments of inertia of said motors being substantially equal;

circuit means including a power source for selectively energizing and deenergizing said pair of motors substantially simultaneously;

means for maintaining said motors in fixed positions relative to one another;

means including gear means operatively coupling the output shafts of said motors in such a manner that the output torque of the apparatus is substantially the sum of the torques of said motors and that the output shafts rotate in opposite directions, whereby the electromagnetic reaction energies developed by said motors when they are rapidly accelerated or decelerated, tend to cancel one another;

said circuit means including switch means for simultaneously coupling said motors to said power source when said switch means is moved to a first position; and

said switch means further including means for simultaneously applying dynamic braking to both of said motors when said switch means is moved to a second position.

4,323,829

CAPACITIVE SENSOR CONTROL SYSTEM

Gary Witney, and Harry Visser, both of Thornhill, Canada, assignors to Barry M. Fish, Ontario, Canada

Filed Jul. 28, 1980, Ser. No. 172,529
Int. Cl.³ H02P *7/68*
U.S. Cl. 318—55 **14 Claims**

1. An electronic control system for controlling the operation of electromotive means, comprising:

electronically capacitive sensing means for detecting proximity thereto by a portion of a human body,

oscillator means responsive to said sensing means operative to produce a series of output pulses having a frequency in accordance with the capacitance input thereto by said sensing means,

discriminator means for detecting the trailing edges of said oscillator pulses and producing a series of fixed width pulses in response thereto,

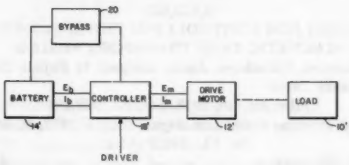
integrator means operative to produce a D.C. voltage in accordance with said discriminator pulses, said D.C. integrator voltage corresponding to the magnitude of the coupled capacitance sensed by said capacitance sensing means.

4,323,830

DC MOTOR CONTROL USING MOTOR-GENERATOR SET WITH CONTROLLED GENERATOR FIELD

Charles A. Belsterling, Norristown, Pa., and John Stone, Medford, N.J., assignors to The Franklin Institute, Philadelphia, Pa.

Filed May 21, 1980, Ser. No. 151,973
Int. Cl.³ H02P *5/20*
U.S. Cl. 318—158 **17 Claims**



1. A system for controlling a d.c. drive motor subject to variable load comprising:

a source of the d.c. current, a motor-generator set having a d.c. generator connected in series between the source of current and the drive motor such that common polarity terminals of the power source and the generator are connected together so that the generator generates a voltage in opposition to the power source, said generator having at least one field winding subject to control, and motor means rotationally coupled to the d.c. generator to drive the generator and electrically coupled to the source of d.c. power, and

means to vary said at least one field winding whereby, when the d.c. drive motor is at rest, the field of the generator is controlled so that its generator voltage output is equal to but opposite to the voltage output of the power source, the motor generator means alternately acting as a motor to drive the generator and as a generator driven by the generator acting as a motor whereby power corresponding to the unused excess energy is fed back into the power source.

4,323,831

COMMUTATOR MOTOR USEFUL FOR DRIVING AUTOMATIC WASHERS

Peter Bradler, Würzburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

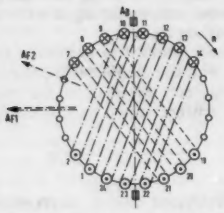
Filed Sep. 21, 1979, Ser. No. 77,654
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842377
Int. Cl.³ H02K *23/64*; H02P *7/36*
U.S. Cl. 318—245 **5 Claims**

1. A stator for a commutator motor useful for driving automatic washing machines, which is operable at different speeds by changing the external connections between an AC single-

phase supply and a stator field winding to change the stator field, comprising:

a stator bore containing slots around its circumference;

a stator field winding having at least first and second parts distributed in said slots around at least a portion of the



circumference, each winding part positioned to produce a field having a different axis; and

means for changing connections to the parts of the stator field winding so that, when going from a low speed to a high speed, the axis of the stator field is rotated in the direction of rotation of the motor.

4,323,832

SYSTEM FOR CONTROLLING THE SPEED OF A MAGNETIC TAPE TRANSPORT MOTOR

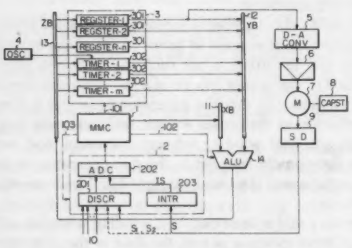
Eiji Okamura, Kamakura, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 26, 1978, Ser. No. 928,104

Claims priority, application Japan, Aug. 5, 1977, 52-93771

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—341 **1 Claim**



1. A system for controlling the speed of a tape transport motor during each revolution of the motor and subsequently during each revolution for selectively controlling information transfers between said tape and an external master unit, said controlling of the speed and the termination of said selective information transfers occurring in correspondence to the rotational position of said motor, said system comprising:

a microcomputer having stored therein respective control programs for said speed control of said motor and for other control operations including said information transfers, said microcomputer outputting with each revolution of said motor a digital signal for controlling the speed of said motor during the following revolution of the motor,

a digital-to-analog converter for converting each said digital output of said microcomputer to a respective analog signal for controlling the speed of said motor during the corresponding revolution of the motor,

a speed detector connected to said motor, said speed detector comprising means for outputting two signals, each said signal comprising a repeated waveform with frequency proportional to the speed of said motor, and each of said two signals having a rising edge and falling edge corresponding to the respective rotational positions of said motor, said two signals differing at least in the phase of said repeated waveforms, and

an oscillator providing clock pulses to said microcomputer, said microcomputer comprising:

means for counting the number of said clock pulses occurring between selected consecutive ones of said edges of a first one of said two signals, said selected consecutive edges of said first signal being separated by one period of the periodic waveforms,

means for operating said speed control program in correspondence with each occurrence of said selected edge of said first signal, including means for transferring said counted number for storage in correspondence with each said selected edge of said first signal, and an arithmetic logic unit for comparing each said stored value with a corresponding value supplied by said speed control program for each said comparison, and for computing each said digital output signal for controlling the speed of said motor,

means for selectively operating said other control programs as time permits between each said operation of said speed control program and each respective subsequent occurrence of a selected one of said edges of the second signal, said selected edges of said second signal also being separated by one period of the periodic waveforms, and

means for stopping the operation of all said control programs in between each said selected edge of the second signal and said selected edge of the first signal,

wherein, the amount of time available for said processing of said other control operations increases as the speed of said motor decreases, and said speed control is initiated, and said processing of said other control operations is terminated, at the corresponding rotational positions of said motor corresponding to the selected edge of the first of said two signals and the selected edge of the second of said two signals.

4,323,833

SEWING MACHINE DRIVE MOTOR CONTROL SYSTEM

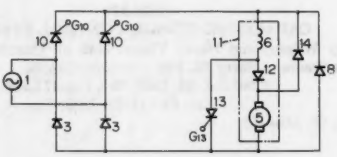
Kazuo Watanabe, Hachioji; Hachiro Makabe, Fussa; Akira Orii, Sagamihara; Michio Hisatake, Hino, and Kazuji Yamamoto, Koganei, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1979, Ser. No. 28,185

Claims priority, application Japan, Apr. 12, 1978, 53/42178; Apr. 20, 1978, 53/45905; May 18, 1978, 53/59428

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—376 **6 Claims**



1. A braking and speed control circuit for use with a DC series motor having a field coil and an armature winding which are entirely in series with each other, which motor is driven by a phase-controlled AC source, comprising;

a forward-biased diode intermediate the field coil and the armature winding and in series therewith;

a first reverse-biased diode placed in parallel with a first series network including only the field coil and the forward biased diode;

a second reversed-biased diode placed in parallel with a second series network including only the field coil, the forward-biased diode and the armature winding; and

a forward-biased semiconductor switch placed in parallel

with a third series network including only the forward biased diode and the armature winding.

4,323,834

MOVEMENT DETECTOR FOR A STEPPING MOTOR

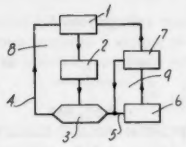
Mai T. Xuan, Chavannes; Marcel Jufer, Morges, both of Switzerland, and Andre Pittet, Bangalore, India, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Aug. 27, 1980, Ser. No. 181,929

Claims priority, application France, Sep. 4, 1979, 79 22609

Int. Cl.³ G05B *19/40*; G04C *3/00*

U.S. Cl. 318—696 **4 Claims**



1. A feed arrangement for a single phase timepiece stepping motor arranged to control the functioning of the motor by means of a first type of bipolar pulses of relatively small width or by a second type of bipolar pulses of greater width, a series of pulses of the second type being applied to the motor whenever said motor has failed to step in response to pulses of the first type wherein first means are provided which responsive to each bipolar pulse of the first type within a first time period 0–t_1 open circuit the motor during a second time period t_2–t_3 and second means are provided to detect a first signal Ui developed at the motor terminals during said second time period and to generate a second signal

$$Uc = \int_{t_2}^{t_3} Ui\, dt$$

which when of greater magnitude to a predetermined reference signal indicates that the motor has failed to step in response to a bipolar pulse of said first type.

4,323,835

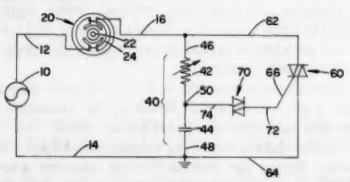
SIMPLIFIED POWER FACTOR CONTROLLER FOR INDUCTION MOTOR

Maw H. Lee, Broadview Hts., Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Mar. 5, 1980, Ser. No. 127,439

Int. Cl.³ H02P *7/36*

U.S. Cl. 318—729 **15 Claims**



1. A method of optimizing the power factor of a less than fully loaded generally constant speed AC induction motor by regulating the time duration of AC supply voltage application to the induction motor in electrical series relation with its AC supply and a gate-controlled, motor-energizing, semiconductor switch comprising the step of varying the time duration by varying the conduction period of the semiconductor switch in accordance with the amplitude of a control voltage generated by the generally constant speed motor during non-conduction periods of the semiconductor switch when the rotor of the motor is freewheeling, the amplitude of the control voltage varying as a function of mechanical loading on the rotating rotor shaft of the motor.

4,323,836

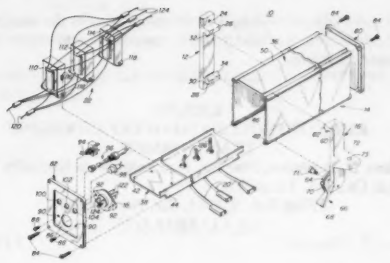
POWER SERVICE MOUNTING SYSTEM

Lawrence F. Rice, 120 Francis Wyman Rd., Burlington, Mass. 01803

Filed May 27, 1980, Ser. No. 153,339

Int. Cl.³ H01M *10/46*; H05K *5/04*; H02B *1/04*

U.S. Cl. 320—2 **8 Claims**



1. A power service mounting system comprising:

a plurality of wall mounting brackets, each having upper and lower spaced gripping means;

a power service housing having upper and lower engaging portions on one side for engagement with said gripping means to hold said housing on a wall and second upper and lower engaging portions on the opposite side, said housing including first electrical connection means for connection with an external power source, second electrical connection means for distributing power, and intermediate circuit means interconnecting said first and second electrical connection means; and

at least one equipment mounting bracket having upper and lower spaced gripping means for engagement with said second upper and lower engaging portions of said housing, one of said upper and lower spaced gripping means of said equipment mounting bracket including clamping means for urging said housing against the other of said upper and lower gripping means, and equipment mounting means for supporting equipment to be serviced by said system.

4,323,837

POWER SUPPLY CIRCUIT FOR AUTOMOTIVE VEHICLES

Kimio Nakamura, Kawasaki; Kimio Fujisawa, Yamato, and Kokichi Ochiai, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,473

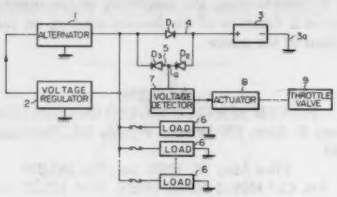
Claims priority, application Japan, Jul. 24, 1978, 53-100654[U]; Jul. 27, 1978, 53-90915; Aug. 8, 1978, 53-108002[U]

Int. Cl.³ H02J *7/14*

U.S. Cl. 322—7 **4 Claims**

1. A circuit arrangement for an engine, said circuit arrangement comprising an alternator driven by said engine, a storage battery, a charging circuit connected between said alternator and said storage battery and including a diode having an anode terminal and a cathode terminal poled in a sense to conduct current from said alternator to said battery, a first plurality of conductors connected from the anode terminal of said diode to associated load circuits of a first group, a second plurality of

conductors connected from the cathode terminal of said diode to associated load circuits of a second group, means responsive to the speed of said engine exceeding a predetermined value,



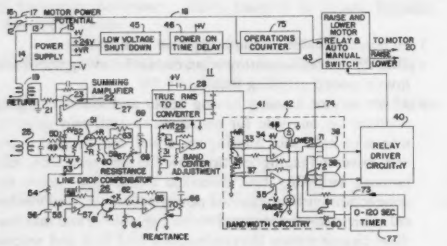
and means for providing a short circuit across the anode and cathode terminals of said diode in response to said engine speed responsive means.

4,323,838

RMS CONTROLLED LOAD TAP CHANGING TRANSFORMER

Robert D. Pettigrew, Pinellas, Fla., assignor to Beckwith Electric Co., Inc., Largo, Fla.

Filed Feb. 9, 1981, Ser. No. 232,667
Int. Cl.³ H02J 3/12
U.S. Cl. 323—256 **7 Claims**



1. In an A.C. power distribution system utilizing tap changing transformers having tap selector switches selectively actuatable by a motor, a tap changer control circuit comprising in combination, means for providing a first voltage representative of the potential to be measured, means for providing a second voltage representative of the system transmission line voltage drop, means for adjusting said first and second voltage, processing said first and second voltages for providing a composite voltage, an RMS to D.C. converter for receiving said composite voltage for providing a true RMS to D.C. output, means for determining a reference voltage range, means for providing a motor drive signal when the converter output is outside said range, and motor circuitry being responsive to said signal to energize said motor to actuate said tap selector switches to change the transformer setting.

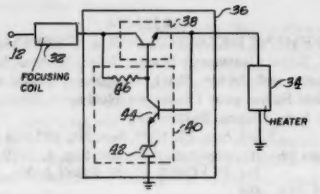
4,323,839

CONSTANT CURRENT LOAD AND CONSTANT VOLTAGE LOAD POWER SUPPLY

Kazuyoshi Imazeki, and Shozo Iguchi, both of 6-2-15 Roppongi, Minato-ku, Tokyo, Japan

Filed Dec. 22, 1980, Ser. No. 219,335
Int. Cl.³ G05F 1/56
U.S. Cl. 323—267 **5 Claims**

1. A constant current, constant voltage power supply comprising current adjusting means and control circuit means for controlling said current adjusting means to feed a constant current to a load connected to an input side of said current adjusting means and a constant voltage to a load connected to the output side of said current adjusting means, respectively, said control circuit means being further responsive to a variation in said constant voltage load for controlling said current adjusting means to supply a constant current and a constant voltage to said two loads, respectively, at the same time.

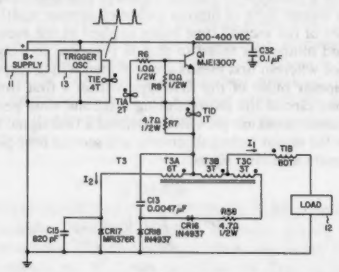


4,323,840

SWITCHING MODE REGULATOR

Glenn B. Gawler, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,052
Int. Cl.³ G05F 1/56
U.S. Cl. 323—287 **7 Claims**



1. A switching mode regulator for energizing a load from a dc power supply comprising:

A. a first and a second input terminal for connection to said dc supply,

B. a pair of terminals between which a load may be connected,

C. an inductor,

D. an intermittently conducting transistor switch having a first and a second electrode, said first switch electrode being connected to said first input terminal;

said inductor and said load terminals being connected to provide serial connection of said inductor and said load in a first path between said second switch electrode and said second input terminal;

E. a first diode connected in a second path, shunting said first path, to conduct inductively sustained current through said load when said switch is off;

F. means to reduce switching stresses on said semiconductor switch during the turn on current transient when stored charge is removed from said first diode comprising:

(1) a current transformer having a core and a first and a second winding closely magnetically coupled, with said first winding serially connected in said second path and the second winding serially connected in said first path, current transformer action, during said transieht, limiting current in said second path to approximate proportionality to said first path current, said first path current being limited by the inductance of said inductor, said

transformer transferring transient energy to said inductor and being magnetized in a set direction, and

(2) means for substantially resetting said transformer by the transfer of transient energy from said inductor through said transformer prior to turn off of said switch.

4,323,841

INDICATING DEVICE FOR USE IN AIRFIELD LIGHTING PLANTS TECHNICAL FIELD

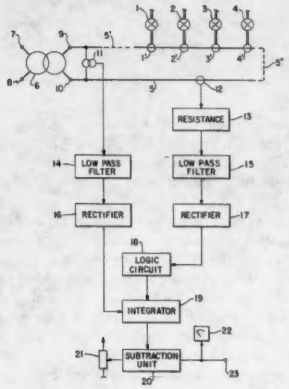
Leif V. Jacobsen, Copenhagen, Denmark, assignor to Christian Gundorph Albertus, Naerum; Erik Steinmann Hansen, Soborg and Leif Heegaard Giortz, Copenhagen, all of, Denmark

Filed Apr. 1, 1980, Ser. No. 136,353

Claims priority, application Denmark, Apr. 4, 1979, 1382/79

Int. Cl.[3] **G01R** *31/02;* **G08B** *21/00*

U.S. Cl. 324—51 **14 Claims**



1. A device for detecting variation in the loading of a circuit coupled to an alternating current source, the circuit being loaded by a plurality of serially interconnected primary circuits of a like plurality of loading transformers having a like plurality of secondary circuits, each secondary circuit being coupled to a respective primary circuit, comprising current signal means for generating a current signal representative of the current flowing in the loaded circuit, voltage signal means for generating a voltage signal representative of the voltage supplied to the loaded circuit, detection means responsive to said current signal and said voltage signal for generating an output voltage signal proportional to the integration of the voltage supplied to the loaded circuit, said integration being from a first predetermined time corresponding to a first circuit current value of approximately zero and a second predetermined time corresponding to a second circuit current value approximately equal to the saturation current for the loading transformers, said output voltage signal being indicative of the number of primary circuits of the loading transformers being uncoupled to their respective secondary circuits.

4,323,842

METHOD AND APPARATUS FOR ELECTRICALLY TESTING RADIATION SUSCEPTIBILITY OF MOS GATE DEVICES

James M. McGarrity, Silver Spring, and Harold E. Boesch, Jr., Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

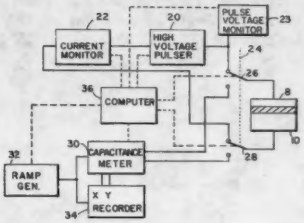
Filed Feb. 19, 1980, Ser. No. 122,208

Int. Cl.[3] **G01R** *31/26*

U.S. Cl. 324—158 R **8 Claims**

1. A method for electrically testing radiation susceptibility of an MOS gate device which comprises a silicon substrate, an insulating silicon dioxide layer and a metal gate comprising the steps of:

injecting a controlled number of electrons into said insulating silicon dioxide layer from said silicon substrate; and



measuring a shift in a capacitance-voltage characteristic of said device.

4,323,843

MAGNETIC CONTAMINATION DETECTOR

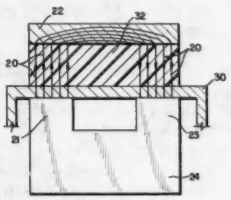
Ian N. Batham, Diery St., Warwick, Queensland 4370, Australia

Filed Nov. 30, 1979, Ser. No. 98,842

Claims priority, application Australia, Dec. 6, 1978, PD7019

Int. Cl.[3] **G01N** *27/74;* **G01R** *33/12*

U.S. Cl. 324—204 **19 Claims**



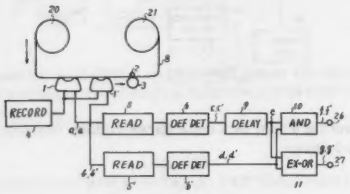
1. Apparatus for detecting magnetisable electrically conductive particles in an electrically non-conductive fluid medium, including sensor means comprising: a plug shaped device having an axis and including means producing a magnetic flux in a flux path extending between two axially spaced apart electrode means electrically insulated one from the other and connectable to circuit means for signalling a condition in which an electrically conductive path is formed from one said electrode means to the other, the lines of force of said flux in said flux path extend substantially rectilinearly in an axial direction from one electrode to the other; and said means for producing the magnetic flux are ferromagnetic means for directing substantially the balance of said flux in a loop path said balance being substantially confined within said ferromagnetic means thereby substantially to prevent nonrectilinear portions of said flux from exerting an influence on magnetisable particles, if any, arranged between said electrode means.

4,323,844

TEST SYSTEM FOR DETECTING A PERMANENT DEFECT AND A TEMPORARY DEFECT IN MAGNETIC RECORDING TAPE

Yoshio Mikame, Saku, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 23, 1979, Ser. No. 41,760
Claims priority, application Japan, May 31, 1978, 53/65167
Int. Cl.[3] G01R *33/12*; G01N *27/82*; H03K *5/22*
U.S. Cl. 324—212 2 Claims



1. A test system for detecting a permanent defect and a temporary defect in magnetic recording tape comprising;

(a) means including a single capstan roller and a single pinch roller for running magnetic tape linearly along a predetermined path in a predetermined direction,

(b) a first magnetic head assembly having a write-head and a read-head, said write-head positioned at a fixed distance from said read-head and at an upper stream side of said path,

(c) a second magnetic head assembly having a write-head and a read-head, said write-head positioned at a fixed distance from said read-head and at an upper stream side of said path, and having a length (l) between the read-head of said first magnetic head assembly and the read-head of said second magnetic head assembly,

(d) a record circuit for providing a signal to be recorded to said write-heads of both said first and said second magnetic head assemblies,

(e) a first and a second read circuit connected to outputs of the read-heads of the first magnetic head assembly and the second magnetic head assembly, respectively,

(f) a first and a second defective-portion-detecting circuit connected to outputs of said first and said second read circuit, respectively,

(g) a delay circuit connected to output of said first defective-portion-detecting-circuit, a delay time (t) of said delay circuit being $t=l/V$, where V is the tape feeding speed,

(h) an AND circuit having a first input connected to output of said delay circuit, and a second input connected to output of said second defective-portion-detecting-circuit, said AND circuit determining whether both said first magnetic head assembly and said second magnetic head assembly have sensed a permanent defect,

(i) an exclusive-OR circuit having a first input connected to output of said delay circuit, and a second input connected to output of said second defective-portion-detecting-circuit, said exclusive-OR circuit determining whether either said first magnetic head assembly or said second magnetic head assembly has sensed a temporary defect,

(j) a first output terminal connected to output of said AND circuit for providing permanent defect detection, and

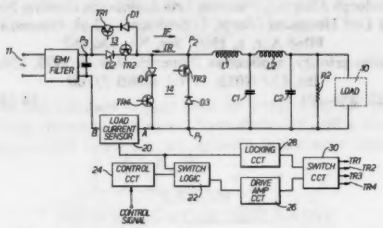
(k) a second output terminal connected to output of said exclusive-OR circuit for providing temporary defect detection.

4,323,845

POWER REGULATING APPARATUS INCLUDING LOAD CURRENT SENSOR MEANS

John M. Leach, Wrexham, Wales, assignor to Gould Advance Limited, Hainault, England

Filed Mar. 5, 1980, Ser. No. 127,510
Claims priority, application United Kingdom, Mar. 6, 1979, 07921/79
Int. Cl.[3] G05F *1/44*
U.S. Cl. 323—224 10 Claims



1. In an electric regulating apparatus including

(a) input terminal means adapted for connection with a source of alternating current;

(b) output terminal means adapted for connection with a load;

(c) series chopper means connected in series between said input terminal means and said output terminal means, said series chopper means including two unidirectional controlled rectifying paths connected in parallel opposition;

(d) shunt chopper means connected in parallel across said output terminal means, said shunt chopper means including two unidirectional controlled rectifying paths connected in parallel opposition; and

(e) control means for controlling said rectifying paths of said series and shunt chopper means by providing switching signals to said series and shunt chopper means at a frequency higher than that of said alternating current source;

the improvement which comprises

(f) load current sensing means for sensing the direction of flow of current between said input and said output terminal means;

(g) said control means being responsive to said load current sensing means for rendering conductive first controlled rectifying paths in said series and in said shunt chopper means at said higher frequency when said flow of current is in one direction, and for alternately rendering conductive second controlled rectifying paths in said series and in said shunt rectifying means at said higher frequency when said flow of current is in the other direction, said alternately conductive paths in said series and shunt rectifying means being so selected as to enable flow of load current in the sensed direction, respectively.

4,323,846

RADIATION HARDENED MOS VOLTAGE GENERATOR CIRCUIT

Tegze P. Haraszti, Garden Grove, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 21, 1979, Ser. No. 50,724
Int. Cl.[3] G05F *3/04*
U.S. Cl. 323—311 37 Claims

1. A voltage generator for tracking the threshold voltage variation of transistor devices comprising:

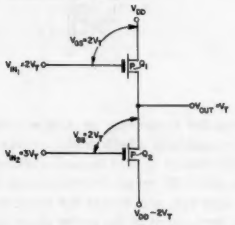
a pair of terminals for connection across first and second sources of potential;

first and second transistor devices connected in electrical series between said first and said second source of potential; each of said transistor devices having respective conduction path terminals and a control terminal; a first

node being formed at the common electrical junction between one of the conduction path terminals of said first transistor, and one of the conduction path terminals of said second transistor;

means for selectively applying a first potential to said control electrode of said first transistor device, comprising a field effect transistor source follower circuit, including:

third and fourth enhancement mode field effect transistors, each having respective conduction path terminals and a control electrode, the conduction path terminals thereof being connected in electrical series between said first source of potential and said control terminal of said first enhancement mode transistor, a second node being formed at the common electrical junction between the conduction path terminals of said third transistor being connected to said second node and the control terminal of said fourth transistor being connected to the control terminal of said first transistor;



first control means connected to said control terminals of said first and fourth enhancement mode field effect transistors for selectively turning said transistors on;

a fifth enhancement mode field effect transistor having respective conduction path terminals and a control electrode, said conduction path terminals thereof being connected in electrical series with the conduction path of said third and fourth enhancement mode field effect transistor, the first conduction path terminal of said fifth transistor connected to the control terminal of said first transistor, the control terminal of said fifth transistor being connected to the control terminal of said second enhancement mode transistor;

means for selectively applying a second predetermined potential to said control electrode of said second transistor device; so that a voltage is generated on said first node substantially equal to the threshold voltage of said first and said second transistor devices; and

an output connected to said first node.

4,323,847

OSCILLATOR TYPE METAL DETECTOR WITH SWITCH CONTROLLED FIXED BIASING

James P. Karbowski, Philomath, Oreg., assignor to Triple Dee Electronics Inc., Lebanon, Oreg.

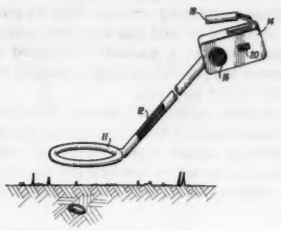
Filed Jun. 11, 1979, Ser. No. 47,225
Int. Cl.³ G01V *3/165*
U.S. Cl. 324—327 **7 Claims**

1. A metal detecting device comprising:

(a) a transistor amplifier including a tuned resonant circuit in the collector circuit of said transistor amplifier; said tuned resonant circuit being adapted to be located near a metal object;

(b) a feedback circuit for providing a current from said resonant circuit to said transistor amplifier input for forcing said amplifier into an oscillating condition;

(c) means for supplying a fixed biasing current to said transistor amplifier in response to a voltage occuring at said amplifier output upon momentary closure of a switch means connected to said amplifier output for maintaining the minimum gain necessary to cause said amplifier to oscillate at substantially the resonant frequency of said tuned resonant circuit in the absence of a metal object in proximity of said resonant circuit, said means providing a new fixed biasing current upon subsequent momentary actuation and release of said switch for reestablishing a



minimum gain for producing oscillations in said amplifier compensating for a change in the effective Q of said resonant circuit due to the presence of said metal object; and

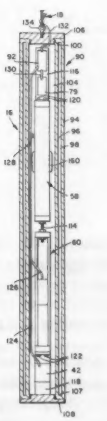
(d) means for indicating when the amplitude of oscillations produced by said transistor amplifier decreases whereby the presence of said object is detected.

4,323,848

PLURAL SENSOR MAGNETOMETER ARRANGEMENT FOR EXTENDED LATERAL RANGE ELECTRICAL CONDUCTIVITY LOGGING

Arthur F. Kuckes, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,764
Int. Cl.³ G01V *3/26*
U.S. Cl. 324—338 **20 Claims**



1. A magnetometer for use in measuring subsurface A.C. injected magnetic fields for borehole logging, comprising;

first and second magnetic field sensors, said first sensor lying in a first plane and said second sensor lying in a second plane;

fastening means for securing said sensors in axial alignment with the plane of said first sensor perpendicular to the plane of said second sensor;

an elongated heat-insulating housing adapted to receive said sensors, said housing having a relatively small diameter and being adapted for insertion vertically into a borehole;

said first and second sensors each including:

first and second generally U-shaped core segments each having first and second spaced, parallel, elongated leg portions extending from opposite ends of a relatively short base portion, said first and second core segments being arranged in back-to-back relationship with their base portions abutting each other;

channel means securing corresponding leg portions of said core segments to hold said segments in assembled relationship to form a generally H-shaped core having elongated leg portions extending parallel to, and defining, the sensor axis; and

coil means surrounding said abutting base portions;

circuit means connected to the coil means of each said sensor for producing signals representing A.C. magnetic field components detected by said first and second sensors; and

means for securing said circuit means on at least one of said sensors.

4,323,849

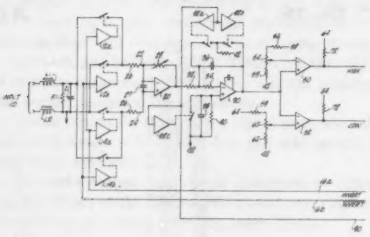
COULOMETER

Stephen H. Smith, Playa del Rey, Calif., assignor to Hybricon, Inc., North Hollywood, Calif.

Filed Jan. 11, 1980, Ser. No. 111,261

Int. Cl.³ G01N *27/42*

U.S. Cl. 324—428 **15 Claims**



1. Apparatus for monitoring the amount of charge supplied by or to at least one storage battery comprising

input means adapted to receive an input signal representative of the current supplied by or to said at least one storage battery and for providing a signal proportional to said input signal,

integrator means responsive to said input means signal for integrating said signal to thereby develop an output signal representative of the charge supplied by or to said at least one storage battery,

threshold detection means responsive to said integrator means for detecting when the output signal of said integrator means exceeds a predetermined threshold,

means responsive to said threshold detection means for resetting said integrator means,

counter means responsive to said threshold detection means for indicating the charge available from said at least one storage battery, and

polarity inversion means responsive to said threshold detection means for inverting the polarity of said input means signal integrated by said integrator means when said integrator means is reset.

4,323,850

MEASUREMENT OF ARTICLES

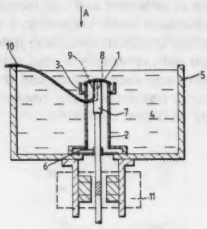
Peter Dawson, Bingley, and John H. Phillips, Cheadle Hulme, both of England, assignors to Kelvin Lenses Limited, Denton, England

Filed Nov. 15, 1979, Ser. No. 94,467

Claims priority, application United Kingdom, Nov. 17, 1978, 44911/78

Int. Cl.³ G01N *27/07*; G01B *7/28*

U.S. Cl. 324—439 **19 Claims**



1. Apparatus for measuring an article comprising a mount for holding the article in a bath of electrolyte, a probe movable along one axis relative to said mount, a reference electrode, in use located in the bath, means for measuring the position of the probe along said axis and means for detecting and indicating when, during movement of the probe along said axis, the probe occupies a predetermined spaced position relative to the article on the mount on the basis of the electrical resistance or impedance between the probe and the reference electrode in the bath, thereby enabling the article to be measured without contact between the article and the probe.

4,323,851

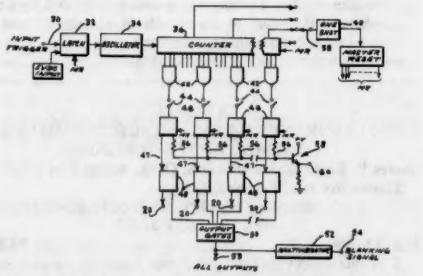
WIDE RANGE MULTIPLE TIME MARK GENERATOR

Walter M. Shedd, Acton, and Donald C. LaPierre, West Acton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 7, 1980, Ser. No. 128,345

Int. Cl.³ H03K *17/00*

U.S. Cl. 328—72 **10 Claims**



1. A wide range variable multiple time pulse generator comprising: a housing having a control panel including means for accepting an input pulse, a plurality of pulse output means, a plurality of switching means corresponding to the output means for selecting discrete output pulses; said housing having mounted therein an electronic circuit connected to the control panel means for providing output signals in response to an input signal, said circuit including an oscillator for generating a series of pulses at a selected frequency, a latch circuit means connected between the means for accepting an input pulse and

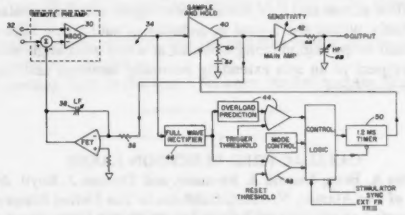
the oscillator, said latch circuit means activating the oscillator in response to a first input pulse; counter means connected to the oscillator for counting pulses generated by the oscillator; a plurality of NAND gate circuits connected to the counter producing a selected binary output; latch circuit means connected to the output of each NAND gate circuit, pulse generating means connected between each latch circuit and the pulse output means whereby a single pulse is generated as a result of the first output pulse from each NAND gate circuit.

4,323,852

FAST RECOVERY ELECTRODE AMPLIFIER

D. David Walker, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Nov. 29, 1979, Ser. No. 98,544
Int. Cl.³ H03F *1/02*
U.S. Cl. 330—9 **4 Claims**



4. A fast recovery audio amplifier comprising a first stage amplifier having a differential input, a second stage amplifier having provision for gain selection and whose input is direct-coupled to the output of said first stage amplifier, a feedback circuit responsive to the output of said first stage amplifier for selectively introducing into the input of said first stage amplifier an offset signal for varying the output of said first stage amplifier at sufficient gain to provide for cancellation of the expected common-mode signal of the differential input of said first stage amplifier, control means normally closing said feedback circuit, and a control circuit responsive to the output of said first stage amplifier so as to provide a signal to said control means immediately to open or close said feedback circuit depending upon the variance of said output signal from a threshold value so as to maintain said first stage amplifier at baseline, and said control circuit including predictive means responsive to the output signal of said first stage amplifier to predict whether or not said signal will vary from said threshold value within a predetermined time and to provide a control signal to said control means to close said feedback circuit if said output signal of said first stage amplifier is or is predicted to be within said threshold value before the expiration of said predetermined time.

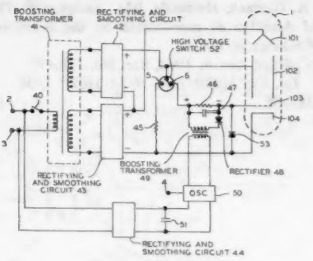
4,323,853

CIRCUIT FOR PROTECTING TRAVELING-WAVE TUBES AGAINST FAULTS OF A POWER SUPPLY

Teruhisa Kurokawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1980, Ser. No. 123,827
Claims priority, application Japan, Feb. 23, 1979, 54-21144
Int. Cl.³ H03F *5/38*
U.S. Cl. 330—43 **3 Claims**

1. A traveling-wave tube apparatus comprising:
AC power supply means;
traveling-wave tube means having a collector electrode, a slow-wave circuit electrode, an anode electrode and a cathode electrode;
power source means responsive to said AC power supply for providing DC voltages to each of said electrodes;
high-frequency oscillator means driven in response to the initiation, termination and interruption in the operation of said AC power for providing a high frequency output;
first rectifying and smoothing circuit means for rectifying and smoothing said high frequency output to provide said anode electrode with a control voltage, said control voltage preventing the electron beam from flowing from said cathode electrode to said slow-wave circuit electrode; and



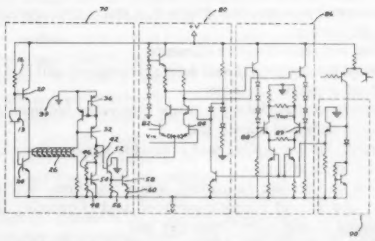
energizing means coupled between said AC power supply means and said high-frequency oscillator means for energing said high-frequency oscillator means,
whereby said traveling-wave tube is protected from damage during said initiation, termination and interruption.

4,323,854

TEMPERATURE COMPENSATED CURRENT SOURCE

Richard E. Hester, Eden Prairie, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jan. 30, 1980, Ser. No. 116,698
Int. Cl.³ H03F *3/45;* H03K *3/26*
U.S. Cl. 330—256 **11 Claims**



1. A temperature compensated current source comprising:
a first semiconductor device for producing a first reference voltage,
means for establishing a first reference current dependent on said reference voltage and connected with said first semiconductor device,
a second semiconductor device adapted to be connected with said means for establishing a first reference current, said second semiconductor device establishing a second reference current in response to said first reference current,
a current source means connected to said second semiconductor device for generating a third reference current essentially identical to said second reference current,
means connected with said current source means for establishing a second reference voltage using the voltage created by passing said third reference current through a resistance,
means connected with said means for establishing a second reference voltage for generating a third voltage related to said second reference voltage by varying the same way

with respect to temperature and without affecting the source of said third reference current, and

means for impressing said third voltage across a resistance and thus creating a current which represents the output current of said circuit.

4,323,855

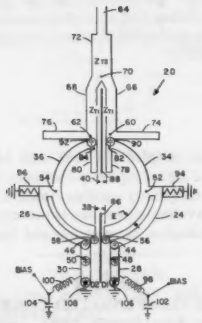
MIC COMBINER USING UNMATCHED DIODES

Horst W. A. Gerlach, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 9, 1980, Ser. No. 138,477

Int. Cl.³ H03B 7/14, 9/14; H01P 7/08

U.S. Cl. 331—56 **16 Claims**



1. A microstrip circuit having microstrip resonator means for oscillation in an even mode including:

(a) first and second microstrip resonator sections adapted to oscillate independently from one another;

(b) each of said first and second resonator sections having first and second ends;

(c) said resonator sections disposed in respective opposition to each other;

(d) first and second active elements;

(e) means for connecting said active elements to said first and second resonator sections;

(f) impedance transforming means connected between said second ends and a load, and

(g) means for decoupling said resonator sections from each other, comprising:

(h) first and second microstrip connecting lines including first and second tuning capacitors, said connecting lines coupled to said active elements, and

(i) first and second decoupling microstrip connectors each coupled to one of said first and second connecting lines, respectively, at its one end, and to said first and second resonator sections, respectively, at its other end.

4,323,856

INJECTION LASER

Peter J. de Waard, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 764,351, Jan. 31, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,797

Claims priority, application Netherlands, Jul. 2, 1976, 7607299

Int. Cl.³ H01S 3/19

U.S. Cl. 372—46 **17 Claims**

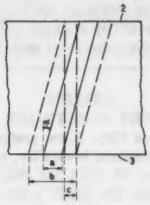
1. A semiconductor laser comprising:

a first layer of an N-type semiconductor material;

a second layer of P-type semiconductor material, said N-type and P-type layers forming a P-N junction in said laser;

means for injecting charge carriers across said P-N junction to induce charge recombination and emission of optical radiation;

a pair of mirrored faces perpendicular to said P-N junction; and



a stripe region adapted to laterally confine charge carrier flow across said P-N junction to a region which is substantially within the lateral boundaries of said stripe region, said stripe region being oriented at a non-zero angle with respect to an axis extending normally between said mirrored faces.

4,323,857

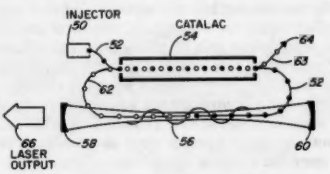
CATALAC FREE ELECTRON LASER

Charles A. Brau; Donald A. Swenson, and Thomas J. Boyd, Jr., all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 12, 1979, Ser. No. 102,804

Int. Cl.³ H01S 3/09

U.S. Cl. 372—2 **16 Claims**



1. A free electron laser for amplifying coherent radiation comprising:

means for producing a beam of electrons;

means for accelerating said beam of electrons to a predetermined relativistic energy using rf accelerating fields;

wiggler means for inducing transverse oscillations in said beam of electrons to amplify said coherent radiation;

means for directing said beam of electrons emerging from said wiggler into said means for accelerating whereby electrons of said beam of electrons emerging from said wiggler are out-of-phase with said rf accelerating fields so as to transform energy from said electrons into energy of said accelerating fields to increase efficiency of said laser.

4,323,858

FOIL COOLING SYSTEM FOR HIGH CURRENT DENSITY ELECTRON-BEAM PUMPED LASERS

James G. Gerstley, Sherman Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 25, 1980, Ser. No. 115,478

Int. Cl.³ H01S 3/02

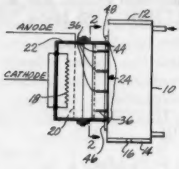
U.S. Cl. 372—107 **12 Claims**

1. A window for transmitting an electron beam from a source contained within a high vacuum chamber into a gaseous region, said window comprising:

an aperature communicating said high vacuum chamber with said gaseous region;

a metallic foil covering said aperture and isolating said gaseous region from said high vacuum chamber;

a thin film of material transparent to the electron beam positioned between the foil and the electron beam source



so that the electron beam passing from the source must pass through the film and through the foil to the gaseous region;

support means securing the foil and film in spaced gas-tight relationship; and

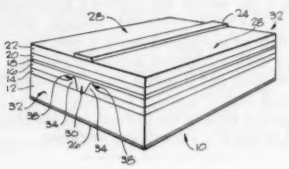
a cooling fluid in the space between the foil and the film.

4,323,859

CHANELLED SUBSTRATE DOUBLE HETEROSTRUCTURE LASERS

Julian P. Noad, Carp; Anthony J. Springthorpe, Richmond, and Christopher M. Look, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 4, 1980, Ser. No. 118,653
Int. Cl.³ H01S 3/19
U.S. Cl. 372—46 **4 Claims**



1. A double heterostructure semiconductor laser comprising:

a substrate;

a blocking layer;

a first confining layer;

an active layer;

a second confining layer;

top and bottom contacts for directing current across a pn junction existing between the active layer and the first confining layer to generate light thereat;

an np junction between the first confining layer and a blocking layer acting to confine current passage to a predetermined region of said pn junction;

the blocking layer having a channel underlying said predetermined region, said first confining layer extending into the channel;

the laser having opposed planar reflecting facets defining a resonant cavity;

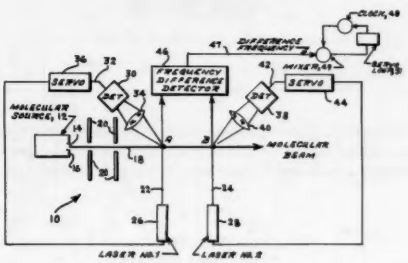
and wherein the blocking layer has raised shoulder portions flanking the channel and the first confining layer is thinner where it overlies the raised shoulder portions than at a location remote from the channel.

4,323,860

LASER EXCITED MOLECULAR BEAM TIME AND FREQUENCY STANDARD

Clare C. Leiby, Jr., Bedford, and Shaoul Ezekiel, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1980, Ser. No. 134,358
Int. Cl.³ H01S 3/13
U.S. Cl. 372—32 **10 Claims**



1. An optically excited molecular beam time and frequency standard comprising:

(a) means for producing a molecular beam

(b) means for producing a first beam of coherent electromagnetic radiation at a first preselected frequency and directing said first beam in a direction intersecting said molecular beam at a first preselected point,

whereby said first beam intersecting said molecular beam at said first preselected point excites the molecules of said molecular beam from an initial state to an intermediate state from which said molecules fluoresce to a final state,

(c) first means for detecting said fluorescence emitted from said intermediate state to said final state and producing a signal in accordance therewith,

(d) means operably connected between said first detecting means and said means for producing said first electromagnetic beam for feeding said signal thereto in order to lock said preselected frequency of said first beam to the resonant frequency corresponding to the transition between said initial state and said intermediate state,

(e) means for producing a second beam of coherent electromagnetic radiation at a second preselected frequency and directing said second beam in a direction intersecting said molecular beam at a second preselected point,

whereby said second beam intersecting said molecular beam at said second preselected point excites the molecules in said molecular beam from said final state back to said intermediate state from which said molecules fluoresce to said initial state,

(f) second means for detecting said fluorescence emitted from said intermediate state to said initial state and producing a signal in accordance therewith,

(g) means operably connected between said second detecting means and said means for producing said second electromagnetic beam for feeding said signal thereto in order to lock said preselected frequency of said second electromagnetic beam to a resonant frequency corresponding to the transition between said final state and said intermediate state, and

(h) means optically aligned with said first and second locked electromagnetic beams for detecting a difference in frequency therebetween, said frequency detecting means producing an output signal representative of said frequency difference.

4,323,861

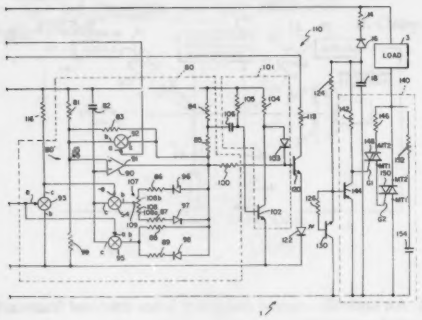
OSCILLATOR CIRCUIT FOR CONTROLLING THE POWER LEVEL OF A MICROWAVE OVEN

Louis M. Sandler, N. Reading; Walter R. Spofford, Bedford, both of Mass., and Charles E. Scott, Noblesville, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Division of Ser. No. 865,309, Dec. 28, 1977. This application Mar. 29, 1979, Ser. No. 25,217

Int. Cl.[3] H03K *3/023;* H05B *6/68*

U.S. Cl. 331—111 5 Claims



1. An oscillator circuit having a variable duty cycle for controlling the power level of a microwave oven, comprising:

a voltage comparator;

an adjustable RC time constant circuit including a capacitance branch and a resistance branch and first coupling means therebetween also connected to one input of said comparator;

a reference voltage source coupled to another input of said comparator;

second coupling means for coupling the output of said comparator to said RC time constant circuit for causing the charging and discharging of said capacitance branch in response to said comparator output and thereby the oscillation of said output;

means for controlling the heating power of a microwave oven in response to the duty cycle of said comparator output oscillations;

said resistance branch including a pair of alternately selectable current paths for the charging and discharging of said capacitance branch;

said first coupling means including semiconductor switch means for selecting and coupling either of said current paths to said capacitance branch for changing the charging and discharging of said capacitance branch in accordance with the selected current path; and

one of said current paths including a pair of parallel connected portions with each of said parallel portions having a diode connected therein for controlling the direction of current flow, said diodes being connected with opposite respective polarities for allowing current flow only in opposite directions in the respective portions, said one current path further including a potentiometer having a pair of fixed terminals each of which is connected to a separate said portion and a variable wiper terminal connected to said first coupling means for simultaneously inversely varying the resistance in said parallel portions, said potentiometer thereby providing for variation of the cooking power of said microwave oven by control of the duty cycle of said comparator output.

4,323,862

FREQUENCY SHIFT MODULATOR WITH CIRCUITRY FOR SIMPLE CHANGE-OVER BETWEEN HIGH AND LOW CHANNELS

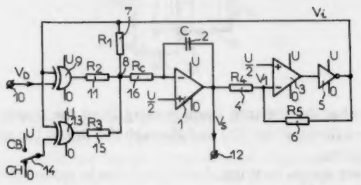
Robert Boudault, Limours, and Gerard Pouzoullic, Gif Zur Yvette, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1980, Ser. No. 138,064

Claims priority, application France, Apr. 6, 1979, 79 08725

Int. Cl.[3] H03C *3/02;* H03K *7/06*

U.S. Cl. 332—9 R 4 Claims



1. A modulator for data transmission by frequency shift modulation comprising a first operational amplifier and an associated capacitor connected so as to form an integrating circuit, a bistable circuit having trigger hysteresis connected to the output of the first operational amplifier for producing a two-level voltage, a first resistor having one end connected to the output of the bistable circuit and the other end coupled to an input of the first operational amplifier so as to produce a triangular voltage at the output of the first operational amplifier, first logic means for applying a voltage equal or complementary to said two-level voltage, depending upon the value of the data signal, to one end of a second resistor whose other end is joined with said other end of the first resistor, characterized in that for generating a first or a second frequency shift modulated signal having different central frequencies and being modulated with the same frequency shift the modulator comprises second logic means for applying a voltage equal or complementary to said two-level voltage, depending on whether the desired modulated signal is said first or said second frequency shift modulated signal, to one end of a third resistor whose other end is joined with the joined ends of the first and second resistors, and a common resistor connected between the joined ends of the first, second and third resistors and the input of the first operational amplifier.

4,323,863

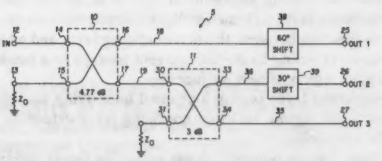
N-WAY POWER DIVIDER/COMBINER

Robert J. Weber, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 869,877, Jan. 16, 1978, abandoned. This application Sep. 27, 1979, Ser. No. 79,616

Int. Cl.[3] H01P *5/18*

U.S. Cl. 333—109 4 Claims



1. A power distribution network comprising:

first port means for receiving power input;

a plurality of second port means for providing outputs, the number of said second port means being equal to an integer which is not equal to an exponential power of two;

power transmission means coupled for transmitting power from said input port means to said plurality of output port means including,

power coupler means for controlling the magnitude of the power transmitted to said second port means for providing a plurality of power outputs, each of said second port means providing a reflected power wave appearing at said input port means in response to power transmitted by said power coupler means, and

phase shift means coupled for phase shifting selected ones of said power outputs and said reflected power waves,

said power coupler means and said phase shift means being constructed and cooperatively arranged to cause the vector sum of said reflected power waves appearing at said input port means to equal zero.

4,323,864

BINARY TRANSVERSAL FILTER

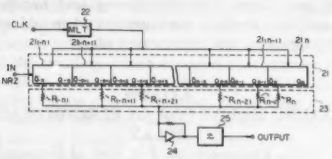
Kazuo Ogawa, Tokyo; Eiji Suzuki, Kawasaki; Osamu Kurita, Yokosuka, and Izumi Horikawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki and Nippon Telegraph and Telephone Public Corp., Tokyo, both of, Japan

Filed Mar. 3, 1980, Ser. No. 126,528

Claims priority, application Japan, Mar. 2, 1979, 54-24982

Int. Cl.³ H03H *15/00, 17/06*

U.S. Cl. 333—165 **7 Claims**



1. A binary transversal filter for receiving NRZ input signals synchronously with clock pulses, comprising:

a shift register, to which the NRZ input signals are fed directly, said register including a plurality of stages which are driven by timing signals of a frequency that is a multiplier M times that of the clock pulses of the input signals,

a weighting circuit for weighting and synthesizing the outputs of each of the stages of said shift register, and

a tap coefficient a_n of said weighting circuit connected to each of the stages of said shift register being given by a sampling value of an interval T/M of an inverse Fourier transform a(t) of

$$A(\omega) = \frac{H(\omega)}{\sum_{N=1}^{M} e^{j\omega\left(\frac{M-2N+1}{2M}\right)T}}$$

wherein $H(\omega)$ denotes a transfer coefficient which gives a response that is to be found, T denotes a repetitive period of the input NRZ signals, and M represents said multiplier.

4,323,865

LADDER-TYPE PIEZOELECTRIC FILTER

Yasuhiro Tanaka, Kashimamachi, and Sasuga Kakehi, Kanazawa, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

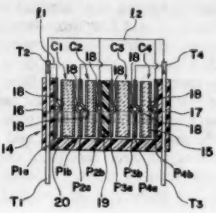
Filed Jan. 3, 1980, Ser. No. 109,283

Claims priority, application Japan, Jan. 11, 1979, 54-2495

Int. Cl.³ H03H *9/54, 9/58, 9/52*

U.S. Cl. 333—187 **6 Claims**

1. In a piezoelectric resonator to be used for a component of a ladder-type piezoelectric filter, said resonator being defined by an element made of a polycrystalline piezoelectric material and having electrode layers located on its opposing surfaces said electrode layers causing said resonator to vibrate in a length-wise extension mode at a predetermined fundamental frequency of said mode when a voltage at said predetermined frequency is applied thereto, the improvement of said piezo-



electric resonator having its said opposing surfaces of a rectangular shape and in whidch the ratio of a short side length to a long side length of the rectangular shape is less than a value of 0.7.

4,323,866

FILTER CIRCUIT

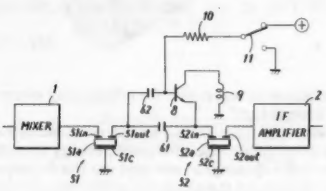
Jiro Inoue, Kanazawa, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed May 8, 1980, Ser. No. 147,720

Claims priority, application Japan, May 24, 1979, 54-69747[U]

Int. Cl.³ H03H *9/52, 9/56, 9/60*

U.S. Cl. 333—188 **2 Claims**



1. A filter circuit, comprising:

a first three-terminal type ceramic filter including an input electrode, an output electrode, and a common electrode, said input electrode of said first three-terminal type ceramic filter being adapted to receive and input signal and said common electrode of said first three-terminal type ceramic filter being connected to a reference potential;

a second three-terminal type ceramic filter including an input electrode, an output electrode, and a common electrode, said output electrode of said second three-terminal type ceramic filter outputting an output signal responsive to said first three-terminal type ceramic filter receiving said input signal, and said common electrode of said second three-terminal type ceramic filter being connected to said reference potential;

a first capacitor having one terminal connected to said output electrode of said first three-terminal type ceramic filter and having another terminal connected to said input electrode of said second three-terminal type ceramic filter;

a second capacitor;

an inductor;

switching means responsive to an enabling signal for selectively connecting said second capacitor between said output electrode of said first three-terminal type ceramic filter and said input electrode of said second three-terminal type ceramic filter and for simultaneously connecting said inductor between said input electrode of said second

three-terminal type ceramic filter and said reference potential; and

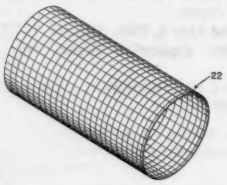
said switching means comprising a transistor having a first electrode, a second electrode and a control electrode; said second capacitor having one terminal connected to said output electrode of said first three-terminal type ceramic filter and having another terminal connected to said control electrode of said transistor; said input electrode of said second three-terminal type ceramic filter being connected to said first electrode of said transistor; said inductor being connected between said second electrode of said transistor and said reference potential; and said transistor being rendered conductive upon receipt of said enabling signal by said control electrode when it is desired to connect said second capacitor between said first and second ceramic filters.

4,323,867

FRAGMENT-TOLERANT TRANSMISSION LINE

Clifford L. Temes, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1980, Ser. No. 181,926
Int. Cl.³ H01P *3/12*
U.S. Cl. 333—239 **1 Claim**



1. An improved waveguide for propagating electromagnetic energy comprising:

a tubular grid made from a brittle, non-conductive material for propagating electromagnetic energy therethrough,

wherein the openings in said grid are small compared to the wavelength of the electromagnetic energy to be propagated within said grid; and

a thin coating of conductive material applied to the interior surfaces of said tubular grid which form the electromagnetic energy propagating surface of the waveguide,

wherein said grid with its thin coating of conductive material is sufficiently brittle such that when penetrated by a projectile, it will have cleanly broken holes therethrough with substantially no inwardly protruding edges.

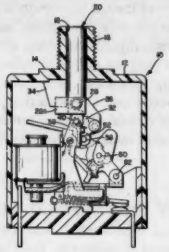
4,323,868

SETTING MECHANISM FOR SNAP ACTION CIRCUIT BREAKER

George S. Harper, Cambridge, Md., assignor to North American Philips Controls Corp., Cambridge, Md.

Filed Oct. 17, 1980, Ser. No. 198,190
Int. Cl.³ H01H *75/10, 5/00*
U.S. Cl. 335—38 **9 Claims**

1. A circuit breaker comprising an electrically insulating housing; an overcurrent sensor in said housing; a stationary and a movable contact in said housing; a latch mechanism coupled to said movable contact, and means for tripping said latch mechanism in response to a sensed overcurrent and for moving said latch mechanism between contacts open and contacts closed positions; means, including an overcenter spring, coupled to said movable contact for opening and closing said contacts with a snap action; a handle opening in said housing; an elongated handle member extending through said handle opening; means for permitting longitudinal axial movement of said handle member while inhibiting rotational movement thereof between a first, contacts open position and a second, contacts closed position; handle link means coupling said handle member to said latch mechanism, said handle link means being operative to translate a substantially linear movement of said handle member into a rotational movement of said link means for urging said latch mechanism into said contacts closed position, said handle link means being operable to retain



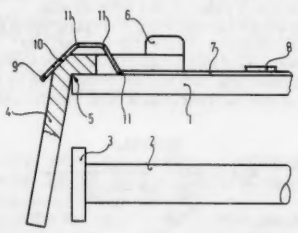
said handle member in its second position upon manual movement of the handle member from its first to its second position and for permitting tripping of said latch mechanism and opening of said contacts independently of movement of said handle member; and means normally biasing said handle member toward said first, contacts open position when said latch mechanism is tripped by said overcurrent sensor.

4,323,869

ARMATURE MOUNT FOR AN ELECTROMAGNETIC RELAY

Werner Minks, Kleingeschaidt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 6, 1980, Ser. No. 157,164
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924263
Int. Cl.³ H01H *51/08;* H01F *7/08*
U.S. Cl. 335—274 **5 Claims**

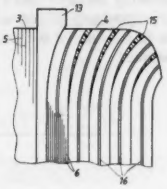


1. An armature mount for an electromagnetic relay having a yoke and core comprising an angle armature supported on the yoke's edge, which is retained in position by a flat spring secured on the yoke and which, towards the yoke's end, is bent off the yoke and, with its free end, presses from the outside against the angular edge of the armature, wherein the straight, free end of the flat spring is applied areally to a flattened part of the angular edge of the armature when said armature is in its end position in which it is lifted off the core, wherein said flat spring following the mounting point is applied with a portion of its length to the yoke and is provided with three obtuse-angled bends at is free end, and wherein the first bend extends angularly away from said yoke and said armature and joins the second bend which extends generally parallel to said yoke toward said end of said yoke and joins the third bend which extends angularly toward said armature for engaging said angular edge of said armature.

4,323,870
TRANSFORMER OR REACTOR HAVING A WINDING FORMED FROM SHEET MATERIAL

Bertil Moritz, and Ole Tönnesen, both of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Aug. 11, 1980, Ser. No. 176,918
Claims priority, application Sweden, Aug. 14, 1979, 7906766
Int. Cl.³ H01F 27/28
U.S. Cl. 336—206 9 Claims

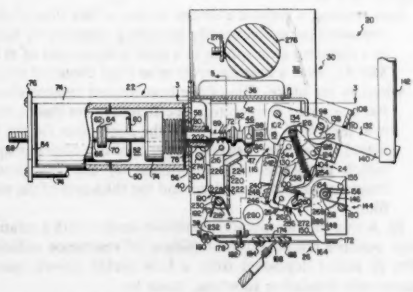


1. A reactor device comprising a core of magnetic material with at least one leg and one yoke and at least one winding including a plurality of turns of sheet-formed conductor material arranged substantially concentrically around the core leg, the conductor sheet having a width substantially equal to the axial length of the winding, said winding further including an inner winding portion and an outer winding portion positioned radially outside the inner winding portion, the conductor sheet in the edge regions of at least the outer turns of the outer winding portion being located at distances from the geometrical axis of the winding which increase successively towards the sheet edge in each respective outer turn, and the cross-sectional bending of the conductor sheet in the edge regions of said outer turns of the outer winding portion increasing with increasing distance from the geometrical axis of the winding in each respective outer turn.

4,323,871
CIRCUIT PROTECTING APPARATUS INCLUDING RESETTABLE VACUUM FUSE AND SWITCH

Eugene L. Kamp, Fulton; Charles A. Popeck, and Armin M. Bruning, both of Centralia, all of Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Mar. 21, 1980, Ser. No. 132,852
Int. Cl.³ H01H 85/00
U.S. Cl. 337—7 25 Claims



1. A current interrupting device adapted to be interposed in an electrical circuit to protect the same from the effects of fault currents, comprising:

a tank adapted to hold a quantity of fluid dielectric material and

circuit protecting means immersed within said dielectric material and including

a current responsive low fault range vacuum interrupter including means defining a substantially evacuated chamber, a pair of normally closed electrical contacts within said chamber, and mechanism for opening said contacts in response to a relatively low magnitude fault current experienced by said circuit,

said mechanism comprising a motive assembly operatively coupled to one of said contacts and shiftable between a cocked position and a tripped position, a heat responsive latching element for releasably holding said motive assembly in said cocked position thereof and for delatching of the motive assembly upon heating of the latching element, and means for heating said latching element and consequent delatching of said motive assembly in response to a relatively low magnitude fault current experienced by said circuit,

a current limiting fuse including a sealed housing and a fusible element within the housing which fuses in response to a relatively high magnitude fault current experienced by said circuit, said housing including structure for retaining the energy of interruption within the housing upon fusing of said fusible element;

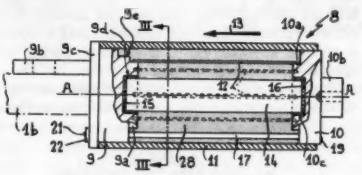
means mounting said latching element out of engagement with and in physically spaced relationship from said current limiting fuse, and with said fluid dielectric material interposed in the zone between said current limiting fuse and latching element; and

means electrically connecting said vacuum interrupter and current limiting fuse in series.

4,323,872
FUSE CARTRIDGES

Jean-Claude Fontaine, 5 rue des Gantries, Ecully, France (69130)

Filed Dec. 27, 1977, Ser. No. 864,906
Claims priority, application France, Jan. 21, 1977, 77 02679
Int. Cl.³ H01H 85/04
U.S. Cl. 337—158 8 Claims



1. A fuse cartridge adapted to be mounted on a support rotatable about a shaft, comprising:

a tubular insulating body having first and second ends, said tubular body having an axis normally disposed radially of the shaft of said rotatable support;

a first metal head at one end of said body, said first head including outwardly extending means for attachment to said rotatable support;

a second metal head at the other end of said body, said first and second heads having axially spaced inner surfaces facing each other;

insulated spacer means disposed axially within said tubular insulating body, said spacer means having a first end supported against the inner surface of said first metal head and having a second end supported against the inner surface of said second metal head, to oppose centrifugal forces and maintain said heads spaced from each other during rotation of said support, the diameter of said spacer means being small as compared with the inner diameter of said tubular insulating body, and said spacer means defining with said tubular insulating body a continuous intermediate annular space whose volume is larger than the volume within the outside diameter of the spacer means;

a plurality of elongated fusible electrical conductor elements disposed in circumferentially spaced relationship within

said continuous annular space and having opposite ends electrically connected with said first head and with said second head; and

a mass of arc quenching material surrounding said fusible elements and filling said continuous annular space.

4,323,873

FUSE

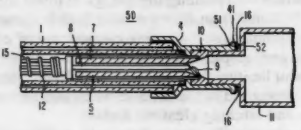
Michiyasu Nounen, and Yukio Iwasaki, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 171,939

Claims priority, application Japan, Jul. 24, 1979, 54-102618[U]

Int. Cl.³ H01H *85/20*

U.S. Cl. 337—186 **3 Claims**



1. A fuse comprising

a hollow outer housing forming an arc extinguishing chamber interiorly thereof, said housing having a flange at one end thereof;

first and second spaced electrical contacts secured to said outer housing;

a fusible member electrically connecting said first and second contacts, said fusible member, upon fusing, causing an arc to be generated within said arc extinguishing chamber;

means for generating an arc extinguishing gas within said arc extinguishing chamber upon fusing of said fusible member;

means forming a cooling chamber disposed contiguously to said arc extinguishing chamber and cooling thereon said arc extinguishing gas, said cooling chamber means having a surface confronting said housing flange and being spaced-apart therefrom; and

a sealing member disposed between said cooling chamber means confronting surface and said housing flange.

4,323,874

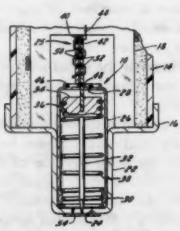
BLOWN FUSE INDICATOR

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Jul. 28, 1980, Ser. No. 173,028

Int. Cl.³ H01H *85/30*

U.S. Cl. 337—244 **16 Claims**



1. In a current limiting fuse of the type having a tubular casing of insulating material, an electrically conductive terminal cap mounted on each end of the casing, a fuse link positioned within the casing and interconnecting the terminal caps, and an arc quenching material completely filling the inside of the casing and embedding the fuse link, the improvement comprising a blown fuse indicator assembly supported by one of said caps; said assembly including, a housing, a striker pin positioned within said housing, means within the housing for driving the striker pin to an indicating position and a second means for holding the striker pin in a driving position; such second means including a vaporizable wire connected to the fuse link, a first non-conductive member connected to said pin, a second non-conductive member connected to said housing, said members each having a plurality of corresponding openings, said wire extending through said openings in said members whereby upon vaporizing of said wire said first non-conductive member is free to move with respect to said second non-conductive member.

4,323,875

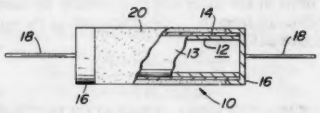
METHOD OF MAKING TEMPERATURE SENSITIVE DEVICE AND DEVICE MADE THEREBY

Joseph A. Tentarelli, Drexel Hill; Richard L. Wahlers, Churchville, and John G. Woods, Philadelphia, all of Pa., assignors to TRW, Inc., Cleveland, Ohio

Filed Jan. 21, 1981, Ser. No. 226,559

Int. Cl.³ H01C *3/04, 7/02*; B05D *5/12*

U.S. Cl. 338—25 **38 Claims**



1. A method of making a thin nickel film temperature sensitive device with a relatively high positive temperature coefficient of resistance utilizing a film of nickel deposited from a bulk nickel source onto an electrically insulating substrate, including the step of

heat treating a resistor element having a thin film of nickel deposited on an electrically insulating substrate by heating in a reducing atmosphere to a peak temperature of at least 550° C., over a heating cycle of at least about 20 minutes,

whereby the nickel film of the heat treated resistor element has a selected temperature coefficient of resistance which is at least 60% of the value of the coefficient for the bulk nickel and a sheet resistance of at least one ohm per square which properties are determined by the heat treating temperature and cycle time, and the thickness of the nickel film.

20. A thin film temperature sensitive device with a relatively high positive temperature coefficient of resistance utilizing a film of nickel deposited from a bulk nickel source onto an electrically insulating substrate, made by

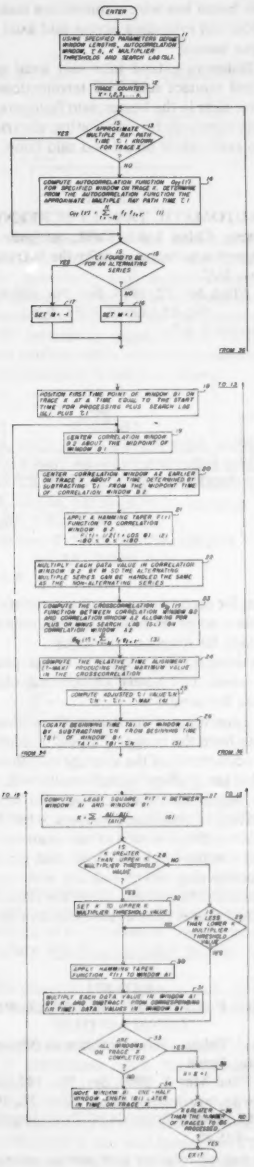
heat treating a resistor element having a film of nickel deposited on an electrically insulating substrate by heating in a reducing atmosphere to a peak temperature of at least 550° C., over a heating cycle of at least about 20 minutes,

whereby the nickel film of the heat treated resistor element has a selected temperature coefficient of resistance which is at least 60% of the value of the coefficient for the bulk nickel and a sheet resistance of at least one ohm per square determined by the heat treating temperature and cycle time, and the thickness of the nickel film.

4,323,876
METHOD FOR REDUCING MULTIPLE EVENTS IN A SEISMIC RECORD

Alvin L. Parrack, Bellaire, and Delbert R. Lunsford, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,267
Int. Cl.[2] G01V *1/36*
U.S. Cl. 367—40 22 Claims



1. A process for suppressing multiple events in seismic traces comprising the steps of:

(a) comparing a first seismic trace segment with a second segment of the same trace to select that portion of the second segment which most closely resembles said first segment;

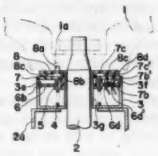
(b) determining the degree of similarity between said selected portion and said first segment; and

(c) extracting a part of said selected portion from said first portion, said part being a function of the degree of similarity between said selected portion and said first segment.

4,323,877
TURN DIRECTION DETECTOR FOR USE IN AUTOMOBILE

Masayuki Morita, Tokoname; Tasuku Nakano, Mizunami, and Kazuhisa Kubota, Ichinomiya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Feb. 18, 1981, Ser. No. 235,736
Claims priority, application Japan, Feb. 22, 1980, 55-21102; Apr. 4, 1980, 55-44759
Int. Cl.[3] B60Q *1/42*
U.S. Cl. 340—56 11 Claims



1. A turn direction detector for detecting the direction of turn of a steering wheel shaft of an automobile comprising:

a support member fixedly connected to a housing of said steering wheel shaft;

first and second terminal means provided on said support member at a predetermined angle spaced from each other about an axis of said steering wheel shaft;

a ring member loosely mounted on said steering wheel shaft, said ring member being rotatable about said steering wheel shaft betwen a first rotated position and a second rotated position;

first electrical contact means provided on said ring member, said first electrical contact means being moved to a position correlative with said first terminal means when said ring member is rotated to said first rotated position, and correlative with said second terminal means when said ring member is rotated to said second rotated position;

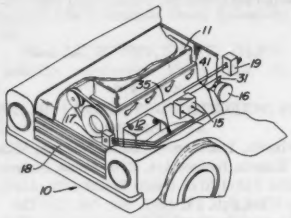
a drive member connected to said steering wheel shaft for effecting the simultaneous rotation with said steering wheel shaft, said drive member having a portion held in contact with said ring member for producing a frictional force between said portion and said ring member, said ring member being moved to said first rotated position when said steering wheel shaft is rotated in a first direction and to said second rotated position when said steering wheel shaft is rotated in a second direction by said frictional force; and

second electrical contact means provided on said drive member, said second electrical contact means slidingly mounting past said first electrical contact means during the rotation of said drive member, whereby a closed electrical circuit is established among said first and second electrical contact means and said first terminal means during the rotation of said steering wheel shaft in said first direction and among said first and second electrical contact means and said second terminal means during the rotation of said steering wheel shaft in said second direction.

4,323,878
SECURITY DEVICE FOR MOTOR VEHICLES AND OTHER D.C. ELECTRICAL SYSTEMS

Anthony J. Luzynski, 3526 Sheffield Ave., Philadelphia, Pa. 19136

Filed Sep. 22, 1980, Ser. No. 189,106
Int. Cl.³ B60R *25/10*; G08B *13/22*
U.S. Cl. 340—63 **7 Claims**

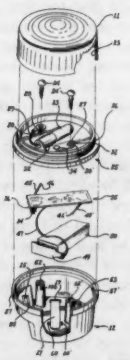


1. A security device for use with a d.c. electrical system including a d.c. source, said device comprising an alarm element connected across said source, relay means including a relay coil and a normally open relay switch, said relay switch being connected to said alarm element to actuate the latter on energization of said relay coil, switch means connected to said relay coil to maintain the latter de-energized in the stand-by condition and energized in the alarm condition, operating means connected to said d.c. source and said switch means to maintain the latter open responsive to constant voltage of said source and effect closing of said switch means responsive to lowered voltage of said source, and delay means controlling the time required by said operating means to assume its open switch means maintaining condition, said relay including an additional relay switch adapted to close and open with said first mentioned relay switch, and timer means connected to said additional relay switch and said switch means for opening the latter and de-energizing the relay coil after a predetermined interval to open said first mentioned and additional relay switches and stop actuation of said alarm element.

4,323,879
BICYCLE SAFETY FLASHER WITH OPTIONAL MOUNTING MEANS FOR OTHER USES

Dale T. Kelley, 2329 N. 39th Pl., Phoenix, Ariz. 85060

Filed Oct. 10, 1980, Ser. No. 195,755
Int. Cl.³ B60Q *1/30*; B62J *5/00*
U.S. Cl. 340—134 **8 Claims**



1. In a safety flasher having a battery case with two inwardly projecting bosses between which a battery is received, each of said bosses having an axial opening therein which is open at the inner end of said boss, a lens closing said battery case, a circuit board providing a flasher circuit, a reflector assembly carrying a lamp with terminals for shining light through said lens, and fasteners for fastening said reflector assembly to said bosses, the improvement wherein:

said bosses have transverse slots therein which intersect said axial openings and are open at the inner ends and at the opposite sides of the respective bosses;

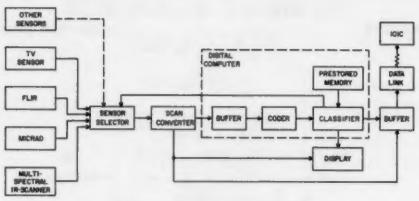
said circuit board has wire terminations seated in said transverse slots and extending across said axial openings in the respective bosses;

and said fasteners extend into said axial openings in the bosses and contact said wire terminations seated in said transverse slots in the bosses, said fasteners also contacting said lamp terminals for completing electrical connections between said circuit board and said lamp.

4,323,880
AUTOMATIC TARGET SCREENING

Bruce T. Lucas, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 22, 1974, Ser. No. 490,431
Int. Cl.³ G06K *9/36, 9/62*
U.S. Cl. 340—146.3 AC **6 Claims**



1. A system for recognizing the characteristics of man-made features within a scene of natural terrain, comprising:

sensing means for imaging said scene;

scanning means for scanning the image provided by said sensing means to identify preselected characteristics of man-made features;

means for generating at least one, three-dimensional phase histogram from the images scanned by plotting the probability of occurrence of the average and absolute difference angles that the gradient vectors make with the line joining adjacent points identified during said scan as having a characteristic of man-made features, wherein said gradient vectors are in the direction of said scan and the angles are measured counterclockwise from said gradient vector;

means for comparing said probability with preselected reference characteristics to recognize the scenes within which man-made features have a preselected probability of being present.

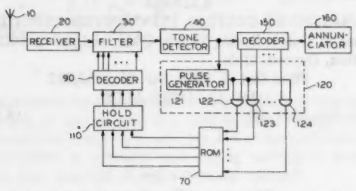
4,323,881
RADIO PAGER WITH REDUCED POWER CONSUMPTION

Toshihiro Mori, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Minato, Japan

Filed May 8, 1980, Ser. No. 147,920
Claims priority, application Japan, May 10, 1979, 54-57241
Int. Cl.³ H04Q *9/10*; G11C *7/00*; H04B *5/04*
U.S. Cl. 340—825.48 **9 Claims**

1. A radio-paging receiver comprising means for receiving any of a plurality of tone signals, said tone signals occurring in a sequence corresponding to an identification of a paged receiver number; band pass filter means having means for selectively altering the center frequency of its pass band in response

to a first control signal in order to selectively pass a corresponding one of said tone signals; means for detecting said selectively passed tone signal; means for storing codes corresponding to a predetermined identification number for an individual receiver, means for successively reading out of said code storing means sequential ones of these codes in response to a second control signal; means responsive to the readout of these codes for holding said readout code in temporary stor-



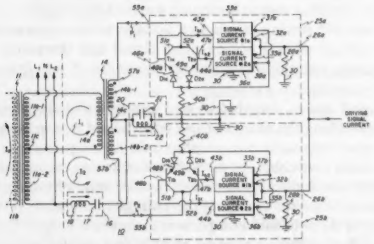
age; decoding means responsive to the temporarily held code for supplying said first control signal to said band pass filter means; means for generating said second control signal in response to the output of said tone-detecting means; means for generating an annunciating signal when said receiver is paged; and gate means for selectively supplying said second control signal to said code storing means in order to sequentially read out said predetermined identification number.

4,323,882

METHOD OF, AND APPARATUS FOR, INSERTING CARRIER FREQUENCY SIGNAL INFORMATION ONTO DISTRIBUTION TRANSFORMER PRIMARY WINDING

Jagdishchandra T. Gajjar, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,454
Int. Cl.³ H04B *3/56*
U.S. Cl. 340—310 R **14 Claims**



1. A method for inserting an information-carrying carrier frequency signal onto a power distribution network connected to a primary winding of a distribution transformer having a plurality of secondary windings coupled thereto, comprising the steps of:

(a) causing a like plurality of currents to each flow through one of the distribution transformer secondary winding sections;

(b) modulating a characteristic of each of said like plurality of currents in accordance with the information to be transmitted; and

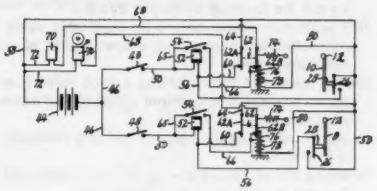
(c) establishing the instantaneous direction of current flow of each of said like plurality of currents to provide in-phase additive contributions to the transformer core flux and to the resulting current flowing in the distribution transformer primary winding to cause the carrier frequency signal current flowing therethrough to be proportional to the sum of the currents flowing in all of said plurality of secondary winding portions.

4,323,883

DOORBELL FOR PETS

Lorin F. Sowards, P.O. Box 85, Brownville, Nebr. 68321

Filed Dec. 31, 1980, Ser. No. 221,546
Int. Cl.³ G08B *3/00*
U.S. Cl. 340—328 **8 Claims**



1. A doorbell for pets comprising:

a. a scratch plate,

b. means supporting said plate on a building door for movement toward said door, the plane of said plate normally being parallel to but spaced apart from said door, and against which a pet desiring passage through said door may scratch to move it toward said door,

c. an electrical switch mounted on said door and operable to be closed by movement of said scratch plate toward said door, and

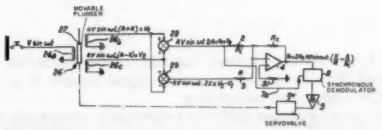
d. an operative electrical circuit including said switch, an electrically operated signalling device, and a source of electric power.

4,323,884

DIGITAL-ANALOG INTERFACE FOR INSERTION BETWEEN A DIGITAL CONTROL SIGNAL TRANSMITTER AND A CONTROLLED MOVING ELEMENT

Michel Durandeau, Toulouse; Norbert Voisin, Bruguieres, and Jean P. Verdier, Cazeres-sur-Garonne, all of France, assignors to Societe Nationale Industrielle Aerospatiale, France

Filed Dec. 5, 1978, Ser. No. 966,722
Claims priority, application France, Dec. 7, 1977, 77 36822
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **5 Claims**



1. In a closed servo-loop system for insertion between

on the one part a control circuit of a moving element, such as the servo-valve of an electrohydraulic servocontrol, whose position X is to be controlled by analog electrical signals, and

on the other part a transmitter of signals for controlling the position X to be imparted to the moving element, said transmitter providing digital electrical control signals,

said closed servo-loop system including

an inductive linear position detector having a movable plunger connected to said moving element and a differential transformer for detecting the position X of said moving element, said detector having a single primary winding and two secondary windings, said two secondary windings generating voltages V_1 and V_2 varying with the position of the movable plunger, the difference of voltages V_1 and V_2 being proportional to the position

X of the moving element and the sum of said voltages V_1 and V_2 being proportional to a constant A, and

a digital-analog interface unit including

first summing means connected to receive said voltages V_1 and V_2 and for adding voltages V_1 and V_2 and for forming an output signal,

second summing means connected to receive said voltages V_1 and V_2 and for subtracting voltage V_1 from voltage V_2 and for forming an output signal,

first resistance means having an adjustable value Ri and connected to receive said output signal of said first summing means,

second resistance means having a fixed value R and connected to receive said output signal of said second summing means,

means for adjusting the value of said first resistance means to $Ri = R \cdot A/X$,

summing circuit means having an input connected to said first and second resistance means, and

a synchronous demodulator having a signal input connected to the output of said summing circuit means and a synchronization input connected to receive said output signal of said first summing means, said demodulator having an output for transmitting an output signal of said interface unit to the control circuit.

4,323,885

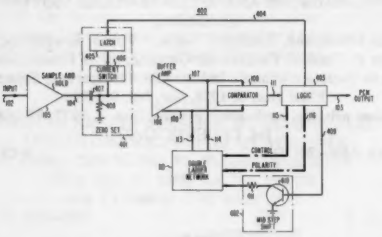
NOISE AND CROSSTALK REDUCTION IN MID-RISER BIASED ENCODERS

Joseph F. Carriere, Andover; Wilmer B. Gaunt, Jr., Boxford, both of Mass.; Joseph E. Landry, Atkinson, and Dewayne A. Spires, Plaistow, both of N.H., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 29, 1980, Ser. No. 192,432

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 CC **14 Claims**



1. A mid-riser biased, successive approximation encoder (400) for converting an analog signal sample to a multi-bit PCM code word comprising;

comparator means (109) for sequentially comparing said analog signal sample to a series of reference signals and generating an output from each comparison, the first comparison being a polarity decision,

reference signal generation means (110) for producing said series of reference signals,

logic means (715) responsive to said comparator output for controlling the sequential application of said reference signals to said comparator and converting said comparator output to a bit of said PCM code word, said encoder characterized by

feedback means (401) for receiving said polarity decision from said comparator and generating a signal therefrom to reduce any dc component in the analog sample signal to substantially zero,

second reference signal generating means (402, 110) for producing a non-zero offset reference signal corresponding to a predetermined intermediate position between two quantizing boundaries, and

control means (701, 702, 711, F1) for the application of said offset reference signal to said comparator immediately following said polarity decision to generate a second polarity decision from said comparator output, said offset reference signal being applied with said series of reference signals until said analog signal sample is coded, said control means also inhibiting said logic means from converting said polarity decision to a bit of said PCM code word and substituting instead said second polarity decision.

4,323,886

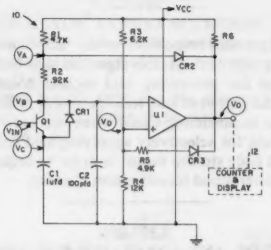
ANALOG-TO-DIGITAL CONVERTER CIRCUIT

Raymond S. Duley, Spring Valley, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 6, 1980, Ser. No. 193,992

Int. Cl.³ H03K *13/20*

U.S. Cl. 340—347 AD **15 Claims**



1. A circuit for generating a digital output signal from an analog input signal applied to said circuit comprising:

a comparison means having first and second inputs thereto, an output therefrom, and a first reference voltage level at said first input thereof;

means for storing an electrical charge, said storing means being operatively coupled to said second input;

first charging means including a switching means for charging said storing means to a voltage which approaches the voltage of said analog input signal and thereafter effectively switching said storing means out of said first charging means;

second means, coupled to said second input for effectively switching the output of said comparison means from a first state to a second state after said storing means is effectively switched out of said first charging means; and

third means responsive to said second state of said comparison means for changing the voltage reference level at said first input of said comparison means to a second level, for reducing the voltage on said storing means, and also for enabling the output of said comparison means to switch to said first state when the voltage on said storing means is reduced to approximately said second level;

said output of said comparison means toggling between said first and second states at a frequency which is dependent upon the voltage of said analog input signal.

4,323,887

CMOS ANALOG TO DIGITAL CONVERTER WITH SELECTABLE VOLTAGE FOLLOWER BUFFERING

Gerald B. Buurma, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

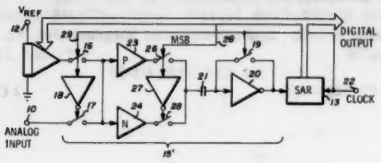
Filed Oct. 23, 1980, Ser. No. 199,890

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **7 Claims**

1. An input buffer circuit for a CMOS analog to digital converter, having an analog input terminal, a successive approximation register for developing a digital output, and a source of reference voltage, said circuit comprising:

first and second unity gain voltage follower devices having common inputs; means for coupling said common inputs to said analog input terminal; and means for selecting, as a function of the most significant bit of said digital output



determined by said successive approximation register, the output of one of said first and second voltage follower devices for coupling to said converter, said selecting being responsive to whether said analog voltage is greater or less than one-half of said reference voltage.

4,323,888

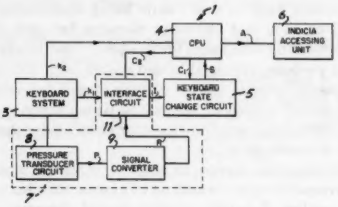
KEYBOARD SYSTEM WITH VARIABLE AUTOMATIC REPEAT CAPABILITY

James A. Cole, East Setauket, N.Y., assignor to Megadata Corporation, Bohemia, N.Y.

Filed Dec. 21, 1979, Ser. No. 106,362

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 A **8 Claims**



1. Apparatus comprising in combination a keyboard system including a plurality of pressure actuatable keys, means including a transducer circuit and being responsive to the actuating pressure applied to any one of a number of said keys for generating an output signal having an amplitude related to said actuating pressure as applied to the actuated one of said number of keys, means responsive to actuation of all of said keys for accessing indicia corresponding to the actuated key, and a repeat circuit including said actuating pressure responsive means and having a converter circuit coupled to said last mentioned means for converting said output signal into a repeat signal during continued actuation of said one of said number of keys, said repeat signal undergoing repetitive state transition at a rate related to said amplitude of the output signal, and said means for accessing indicia further responds to said repeat signal by repetitively accessing the indicium corresponding to said one of said number of keys.

4,323,889

MATRIX DISPLAY DEVICES

Hassan P. A. Salam, London, England, assignor to Unisplay S.A., Geneva, Switzerland

Filed Aug. 11, 1980, Ser. No. 176,808

Claims priority, application United Kingdom, Aug. 16, 1979, 28559/79

Int. Cl.³ G09F *11/00*

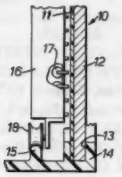
U.S. Cl. 340—373 **16 Claims**

1. Display apparatus comprising:

a flexible display matrix assembly having a plurality of display elements arranged in horizontal and vertical rows, support portions of said assembly being disposed adjacent opposite edges thereof;

movable electromagnetic head means having electromagnetic heads for activating the display elements in respective rows of said matrix assembly;

guide means extending the length of one of said horizontal and vertical rows for guiding said electromagnetic head means during movement thereof;



means attaching said guide means to one of said support portions of the matrix assembly so as to maintain a defined distance between said guide means and the display elements of said one of said horizontal and vertical rows of said matrix assembly; and

resilient means applying tension between said support portions so as to maintain said matrix assembly substantially flat.

4,323,890

SWITCHING CIRCUIT FOR MONITORING THE SWITCHING STATE OF SWITCH ELEMENTS

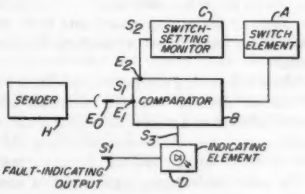
Andreas Lemke, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,309

Claims priority, application Fed. Rep. of Germany, May 22, 1979, 2921095

Int. Cl.³ G08B *25/00*

U.S. Cl. 340—524 **6 Claims**



1. A switching circuit for monitoring the switching state of switching elements, including a switching element responsive to a switch control signal connected thereto to switch from one switching state to another switching state, and a switch-setting monitor connected for recognizing the switching state of said switching element and accordingly producing a monitor signal which corresponds to the switching state, the improvement comprising:

(a) a timing stage for producing clock impulse signals for synchronously controlling a synchronizing stage and a comparator stage;

(b) a synchronizing stage connected to receive a timing signal from said timing stage and an input signal, and adapted to transmit said input signal upon receipt of said impulse signals;

(c) a comparator stage connected to receive clock impulse signals from said timing stage, the input signal transmitted from said synchronizing stage, and the monitor signal from said switch-setting monitor, and adapted to switch

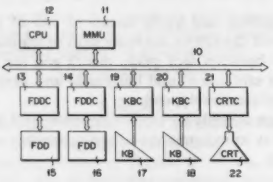
said switching element with and in response to said input signal and to compare said monitor signal and said input signal for producing a fault signal which is connected to said switching element to change the switching state when said monitor and input signals diversely indicate a fault in that said switching element is in different switching states.

4,323,891

CURSOR DISPLAY CONTROL SYSTEM FOR A RASTER SCAN TYPE DISPLAY SYSTEM

Kazuo Akashi, Ome, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 25, 1980, Ser. No. 143,798
Claims priority, application Japan, Apr. 27, 1979, 54-51441
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—709 **7 Claims**



1. A cursor display control system for a raster scan type display system which divides a raster scan type display screen and provides the display information to the respective divided sides by using a mirror reflection comprising;

a display unit for displaying dot data in a raster scan manner;

a programmable CRT controller for interfacing the display unit of the raster scan type and for producing a refresh memory address, a raster address and timing signal for displaying data on the display screen in order that the screen can be programmably set;

a refresh memory for storing coded data to be displayed in response to the refresh memory address obtained from the controller;

raster address converting circuit means which receives the raster address obtained from the controller and converts the raster address to a converted raster address;

multiplexer means for selectively outputting the raster address from the controller and the converted raster address from the raster address converting circuit means on the basis of control information contained in the refresh memory address;

a character generator for converting the coded data inputted from the refresh memory into display pattern data on the basis of raster address information obtained from the multiplexer means;

bidirectional shift register means which receives the pattern information from the character generator, determines the shift direction on the basis of the control information contained in the refresh memory address, and produces serial dot data to the display unit;

cursor address information storing means for storing cursor address information supplied from a central processing element through a system bus;

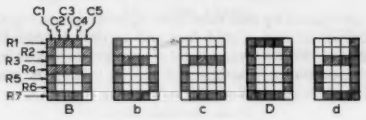
comparing means which compares the cursor address information outputted from the cursor address information storage means with the refresh memory address outputted from the programmable CRT controller and produces a cursor display signal when both the cursor address information and the refresh memory address are coincident with each other.

4,323,892

ALPHA-NUMERIC CHARACTER GENERATOR ARRANGEMENT

John R. Kinghorn, Sutton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,218
Claims priority, application United Kingdom, Feb. 12, 1979, 04846/79
Int. Cl.³ G09G *00/00*
U.S. Cl. 340—724 **2 Claims**



1. A character generator arrangement for generating alphanumeric characters for display by electrical means, said arrangement comprising:

a character store in which each of the different characters are stored in a co-ordinate matrix of discrete character elements, each of said matrix being addressable by row and column, said character elements for each character representing a decender letter—lower case letters g, j, p, q and y—being arranged in said matrix such that character elements forming the tail of each of said decender letters are stored in rows of said matrix which precede the rows in which the remaining character elements for the particular decender letter are stored;

addressing means having an input for receiving input signals corresponding to the address of a particular character, and a plurality of outputs, coupled to said character store for providing, in parallel, the address of said particular character;

row selection means coupled to said store for selecting, in sequence, the row addresses for any of said characters, said row selection means further including means for repeating the selection of said addresses, in sequence, whereby, in the case of said decender letters, at least the addresses of the character rows containing the character elements pertaining to the tails of the decender letters are repeated;

data output means coupled to said character store for providing character element data in the selected character element row of the selected character;

enabling means coupled to said row selection means for causing said data output means to generate said character element data by row in sequence for said selected character;

and

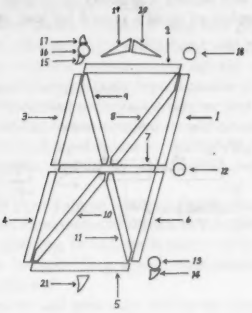
detector means coupled to said addressing means and said enabling means for indicating to said enabling means the selction of the address of any of said decender letters, whereby, when said detector means indicates the presence of a decender letter address, said enabling means suspends the operation of said data output means for the initial rows comprising the tail of the decender letter, thereafter allowing the data output means to supply the character element data for the remaining portion of said selected character address which would include the repeat of the first rows containing the character elements representing the tail of the decender letter.

4,323,893

MULTI-SEGMENT ALPHANUMERIC DISPLAY FOR GREEK AND ENGLISH CHARACTERS

John Ypsilantis, and Anna Ypsilantis, both of 1/124 Morts Rd., Mortdale, N.S.W. 2223., Sydney, Australia

Filed May 15, 1979, Ser. No. 39,149
Claims priority, application Australia, May 18, 1978, 499808
Int. Cl.[3] G09G 3/04
U.S. Cl. 340—756 10 Claims



1. A device for displaying different languages which may include the English and Greek alphabets with punctuation, comprising:

a first parallelogram-shaped array of display segments which may be used to represent letters of said language alphabets;

a second array of display segments located outside of said parallelogram-shaped first array;

said second array including at least a first and a second shaped segment, each of said first and second shaped segments being located at the top of said first parallelogram-shaped array, and shaped and positioned to form a diacritical mark or punctuation mark; and

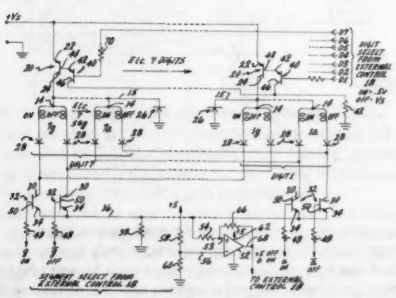
said first and second segments together forming a third mark.

4,323,894

CIRCUIT FOR DRIVING ELECTROMAGNETICALLY-ACTUATED DISPLAYS

William D. Wood, 141 - 22nd St., Del Mar, Calif. 92014, and Kenneth L. Davidson, 2320-1/2 Brant St., San Diego, Calif. 92101

Filed May 9, 1980, Ser. No. 148,386
Int. Cl.[3] G09G 3/20
U.S. Cl. 340—764 4 Claims



1. A low current drain circuit for selectively driving a plurality of electromagnetically actuated displays employing a plurality of digits, each of said digits having a plurality of indicator segments, each of said segments having on and off states, each of said states having an energizing coil associated therewith, said segments remaining in their last driven state until driven to their opposite state, said circuit comprising:

an external control means for selectively controlling said on and off states of said indicator segments;

a power drive means responsive to said external control means for providing a drive current through the coils requiring a change of state; and

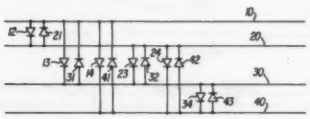
feed-back means for maintaining said drive current within a predetermined value range by alternating the energizing and de-energizing of said external control means.

4,323,895

DISPLAY DEVICE FOR DASHBOARD OF AUTOMOBILE

Jean C. Coste, Marly le Roi, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Apr. 24, 1980, Ser. No. 143,489
Claims priority, application France, May 11, 1979, 79 12073
Int. Cl.[3] G09G 3/00
U.S. Cl. 340—782 5 Claims



1. A display device comprising:

plural electroluminescent diode pairs, the diodes of each diode pair parallel connected anode-cathode;

n parallel power conductors (n>2), connected to said plural diode pairs with only one diode pair connected between any two respective power conductors; and

means for selectively supplying each of the conductors with a high voltage state, a low voltage state or a high impedance state;

wherein for each conductor said selectively supplying means comprises:

a series connection between a positive voltage source and ground of,

a resistor

a pair of transistors connected between said resistor and ground, the collector and emitter portions of said transistors being series connected at a common point coupled to a respective conductor, and each transistor having a base connected to a respective control voltage source through a respective base resistor.

4,323,896

HIGH RESOLUTION VIDEO DISPLAY SYSTEM

Wayne Fiedler, Burbank, and Gregory E. Slobodzian, Bartlett, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

PCT No. PCT/US80/00280, § 371 Date Mar. 18, 1980, § 102(e) Date Mar. 18, 1980
PCT Filed Mar. 18, 1980, Ser. No. 245,344
Int. Cl.[3] G09G 3/22, 3/26
U.S. Cl. 340—800 9 Claims

1. A high resolution system for displaying video images on a pluraity of variable intensity display devices in real time, said images representing selected portions of video frames received from a video source in raster (TV) format, said system comprising:

(a) a video converter receiving the raster lines of video information corresponding to each frame, said converter including quantizing means for generating digital data representative of the relative intensity of said video information at selected points on selected raster lines of said frames and means for selecting which lines and the number of said points per line for which digital data is generated, said digital

data being generated at a first rate, sufficient to keep up with the rate at which the video information is received;

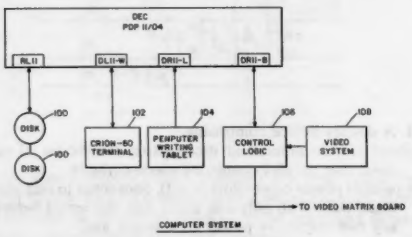
(b) transmitter means receiving said digital data at said first rate for transmitting it to said display devices in a modified raster line format without frame storage, said transmitter means including means for dividing each line of digital data into at least two segments and means for transmitting in parallel the data for each of said segments to said display devices,.

whereby the line at a time raster format of the video information is retained but the effective rate of transmission of data to the display devices corresponding to each segment is reduced to a second rate approximately equal to said first rate divided by the number of said segments, the reduced data rate permitting display of an increased number of data points per raster line and/or the use of more raster lines from the video source;

(c) interface means for selectively connecting said converter to said transmitter means;

(d) means for controlling the operation of said interface means thereby directing the transfer of data between said converter and transmitter means.

9. A rotation circuit for manipulating digital data stored in a



buffer memory representing information to be displayed on a matrix of display devices for causing said information to appear to travel across the display matrix in a selected direction, said circuit comprising:

(a) means for cyclically and sequentially addressing selected memory locations in said buffer to cause data to be read from and restored to said locations;

(b) shift register means recieving the data from each addressed buffer location for shifting said data a selected number of bits in a selected direction and restoring the shifted data to the same buffer location;

(c) linking register means operatively connected to said shift register means for receiving and temporarily storing the bits shifted out one side of the shift register means during each shift cycle and for inserting the shifted bits back into the other side of said shift register means during the next shift cycle corresponding to the next buffer address in the sequence,

whereby the data in the addressed locations are shifted in a selected direction across the buffer so that a repetitive display of the data in the buffer, after each shift cycle is complete, will cause the data to appear to travel across the matrix in the manner of a travelling sign display.

4,323,897

TARGET DETECTING DEVICE WITH IMPROVED COUNTER-COUNTERMEASURES CAPABILITY

Robert A. Creighton, Scottsdale, Ariz., and Stephen M. Engel, Columbia, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1970, Ser. No. 40,522
Int. Cl.[3] G01S 7/36
U.S. Cl. 343—18 E **1 Claim**

1. In a target detecting device having an improved counter-countermeasures capability, the combination comprising:

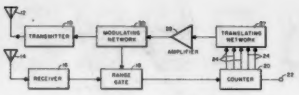
(a) transmitter circuit means for transmitting pulsed signals,

(b) receiver circuit means for receiving echos of said transmitted signals,

(c) modulating network circuit means coupled to said transmitter circuit means for controlling the pulse repetition frequency of the transmitted signals,

(d) range gate circuit means coupled to said receiver circuit means for passing signals of predetermined amplitude and time sequence,

(e) counter circuit means coupled to said range gate circuit means and having a plurality of outputs dependent upon the number of signals passed by said range gate circuit means,



(f) a summing network coupled to said counter circuit means for summing the outputs from said counter circuit means,

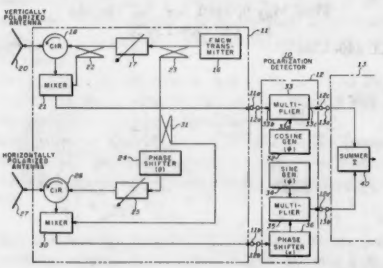
(g) an astable multivibrator coupled to said modulating network circuit means and to said summing network for randomly changing the output of said modulating network circuit means in response to and each time a received echo signal is accepted by said receiver circuit means and in accordance with the code generated when said received signals shifted through said counter circuit means.

4,323,898

POLARIZATION DETECTOR

Richard M. Barnes, Acton; George M. Vachula, Harvard, and Clarence L. Bennett, Jr., Groton, all of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,797
Int. Cl.[3] G01S 13/02
U.S. Cl. 343—5 SA **14 Claims**



1. A radar target polarization detector comprising:

means for receiving electromagnetic signals having at least first and second signal components each having non-identical predetermined polarizations and for providing first and second signals representative thereof;

means coupled to said receiving means for modifying said received signals in accordance with preselected polarization angles and relative phase shifts for providing first and

second modified representative signals, said modifying means comprising:

first input means for receiving said first representative signals;

second input means for receiving said second representative signals;

means coupled to said first input means for phase shifting said first representative signal;

means for generating signals representative of the sine of preselected polarization angles;

first multiplier means coupled to said sine generator and said phase shift means for multiplying said phase shifted signals by said sine representative signals;

means for generating signals representative of the cosine of said preselected polarization angles; and

second multiplier means coupled to said cosine generator and said second input means for multiplying said second representative signals by said cosine representative signals;

means coupled to said signal modifying means for processing said modified representative signals to establish time averages corresponding to said polarization of said received signals and for providing signals representative of said time averages; and

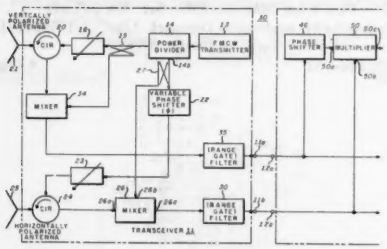
means coupled to said processor means for comparing said time averaged signals to predetermined threshold signals.

4,323,899

POLARIZATION DETECTOR

Richard M. Barnes, Acton, and George M. Vachula, Harvard, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,798
Int. Cl.³ G01S *13/02*
U.S. Cl. 343—55 A **13 Claims**



1. A radar polarization detector comprising:

means adapted to receive electromagnetic signals having a plurality of signal components each having nonidentical predetermined polarizations for providing signals representative of said received signal components;

means coupled to said receiving means for processing said representative signals to establish time averages corresponding to said polarization of said signals and for providing signals representative of said time averages; and

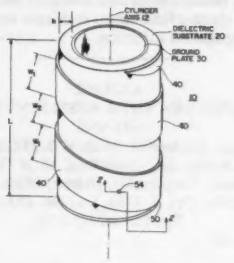
means coupled to said processor means for comparing said parameter representative signals to predetermined threshold signals and for providing signsls indicative of said time average representative signals having a signal level greater than said threshold signal.

4,323,900

OMNIDIRECTIONAL MICROSTRIP ANTENNA

Albert D. Krall, Rockville; John W. McCorkle, College Park; John F. Scarzello, Columbia, and Albert M. Syeles, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1979, Ser. No. 80,596
Int. Cl.³ H01Q *1/38*
U.S. Cl. 343—700 MS **8 Claims**



1. An omnidirectional antenna, comprising:

a hollow right circular cylinder of a non-conducting material;

an electrically conducting medium covering the interior circumferential surface of the cylinder;

a strip conductor of uniform width spiraling to a narrow taper wound as an open loop about the exterior cylindrical surface of the cylinder and adapted to be connected to a feedline;

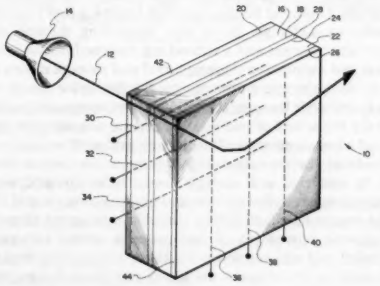
means for electrically coupling the coating at one base of the cylinder to the strip conductor.

4,323,901

MONOLITHIC, VOLTAGE CONTROLLED, PHASED ARRAY

Roger E. De Wames; William F. Hall; William W. Ho, and Teong C. Lim, all of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 19, 1980, Ser. No. 122,331
Int. Cl.³ H01Q *19/06*
U.S. Cl. 343—754 **19 Claims**



1. A phased array for steering an electromagnetic wave, comprising:

a thin layer of active material having an $n_o^3 r$ product of at least 10^{-5} meters per Volt at microwave frequencies where n_o is the refractive index and r is the electro-optic coefficient of said material, said layer including first and second surfaces and defining a wave propagation direction therethrough;

a first array of thin film electrodes disposed on said first surface and in electrical contact with spaced regions of said first surface;

a first series of thin film conductors, each of said conductors electrically contacting one electrode in said first array;

a second array of thin film electrodes disposed on said second surface and in electrical contact with spaced regions of said second surface; and

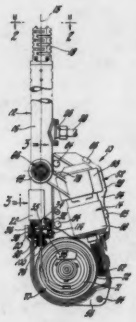
a second surface of thin film conductors, each of said conductors electrically contacting one electrode in said second array such that an electric potential applied to corresponding electrodes in said first and second arrays will create an electric field across said layer and parallel to said wave propagation direction.

4,323,902

POWER ANTENNA WITH RESILIENT MOUNTING MEANS

James L. Hussey, Centerville; Michael B. Miller, Bellbrook, and William C. Staker, Jr., Springfield, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 3, 1980, Ser. No. 193,659
Int. Cl.³ H01Q *1/10*
U.S. Cl. 343—903 **3 Claims**



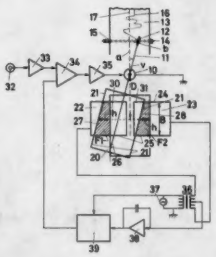
1. In a power operated antenna installation including a tubular antenna mast jacket disposed vertically and rigidly attached to a support structure, telescoping antenna means disposed on the longitudinal axis of said mast jacket for movement between an extended signal reception position and a retracted position within said mast jacket, power actuator means including a generally L-shaped housing portion having a first leg disposed parallel to said mast jacket and supporting thereon electric motor drive means and a second leg disposed below said mast jacket and supporting thereon a reel and storage means operable by said electric motor means, flexible drive means operative to transmit force in tension and in compression projecting into the lower end of said mast jacket and connected at one end to said antenna means and projecting into said housing portion immediately below said mast jacket for connection at the other end to said reel and storage means whereby said reel and storage means applies tension and compression on said flexible drive means to effect bodily shiftable movement thereof and consequent movement of said antenna means between said extended and said retracted positions, and a guide bushing on said mast jacket adjacent the lower end thereof engaging said flexible drive means and operative to center said drive means on the longitudinal axis of said mast jacket while simultaneously resisting lateral displacement of said flexible drive means relative to said mast jacket, in said antenna installation the improvement comprising, a pair of mounting pins rigidly attached to said mast jacket and aligned on a transverse axis thereof, a pair of support arms rigidly attached to said housing portion generally adjacent the upper end of said first leg and straddling said mast jacket, a pair of elastomeric grommets disposed between respective ones of said support arms and corresponding ones of said mounting pins, said grommets providing primary resilient support for said housing portion on said mast jacket by permitting controlled displacement of said housing portion relative to said mast jacket in resilient fashion whereby displacement is resisted by forces proportional to displacement, an elastomeric combination seal and grommet disposed on said second leg generally immediately below said mast jacket and slidably and sealingly receiving said flexible drive means, said combination seal and grommet being relatively stiffer than said elastomeric grommets and operative to resist displacement of said second leg laterally of said flexible drive means in resilient fashion whereby resistance is proportional to displacement, said flexible drive means and said guide bushing in close proximity to said combination seal and grommet cooperating to resist lateral displacement of said second leg of said housing portion relative to said mast jacket.

4,323,903

STRIP CHART RECORDER WITH A DIFFERENTIAL CAPACITOR SERVING AS POSITION SENSOR IN A POSITION SERVO FOR THE RECORDING PEN

Svend E. Fauerskov, Holte, and Svend O. Sjostrom, Copenhagen, both of Denmark, assignors to A/S Brüel & Kjaer, Naerum, Denmark

PCT No. PCT/DK80/00017, § 371 Date Nov. 22, 1980, § 102(e) Date Nov. 14, 1980, PCT Pub. No. WO80/02070, PCT Pub. Date Oct. 2, 1980
PCT Filed Mar. 21, 1980, Ser. No. 217,010
Claims priority, application Denmark, Mar. 22, 1979, 1171/79
Int. Cl.³ G01D *15/00*
U.S. Cl. 346—32 **4 Claims**



1. A strip chart recorder including a recording arm rotatable about a shaft perpendicular to the recording plane and the angular position of which is servo-controlled inasmuch as a position sensor of a differential capacitor type is incorporated in a position servo for the recording pen, characterized in that the rotor plate and the stator plates of the differential capacitor are so shaped that, for a rotation of the rotor plate through an angle v, the overlap area A of the plates changes by an amount ΔA which is proportional to the tangent of the angle v.

4,323,904
MAGNETIC PRINTING PROCESS AND APPARATUS

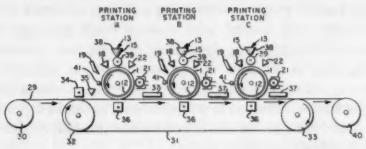
Donald W. Edwards, Wilmington, Del., and Emery J. Gorondy, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 777,242, Mar. 15, 1977, Pat. No. 4,195,303, which is a continuation-in-part of Ser. No. 771,062, Feb. 25, 1977, Pat. No. 4,117,498, which is a continuation-in-part of Ser. No. 672,553, Mar. 31, 1976, abandoned, and a continuation-in-part of Ser. No. 892,290, Mar. 31, 1978, abandoned, which is a division of Ser. No. 771,062, Feb. 25, 1977, Pat. No. 4,117,498. This application Sep. 13, 1979, Ser. No. 75,513

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

Int. Cl.[3] G11B *9/00*

U.S. Cl. 346—74.7 21 Claims



1. Magnetic printing apparatus, for use in forming on a substrate a colored print of an original colored design, comprising means for developing the magnetic image of a photocolor-separated film positive of the original design on a ferromagnetic material which is capable of continuously discharging an electric charge through its thickness to a grounded electrically conductive support on which it is imposed with a toner comprising a ferromagnetic component, a dye and a resin which substantially encapsulates said component and dye; and means for transferring the developed image directly or through an intermediate substrate to an ultimate substrate.

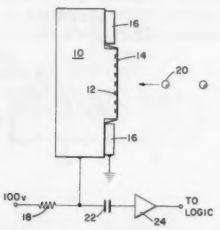
4,323,905
INK DROPLET SENSING MEANS

Peter H. Reitberger, Munich, and Helmut Weber, Augsburg, both of Fed. Rep. of Germany, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 21, 1980, Ser. No. 209,088

Int. Cl.[3] G01D *15/18*

U.S. Cl. 346—75 15 Claims



1. Apparatus for detecting the presence of ink droplets comprising an

electrode member having an uneven surface, an

insulating sheet covering the uneven surface, said sheet having a conductive coating on one side thereof distal from the electrode member, and

voltage means connected to said electrode and to the conductive coating and responsive to ink droplets impinging on and deflecting said insulating sheet thereby causing a change in voltage at the electrode to indicate the impact of the ink droplets and to generate a pulse in response thereto.

4,323,906
DEVICE FOR CORRECTING PITCH OF SCANNING LINES IN A LIGHT BEAM RECORDING SYSTEM

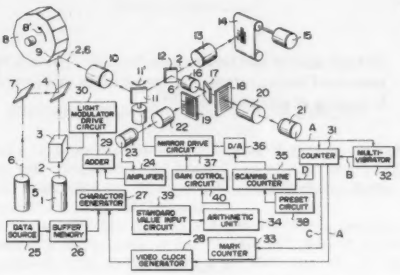
Masahiro Ohnishi, and Tsutomu Kimura, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 25, 1980, Ser. No. 172,249

Claims priority, application Japan, Jul. 26, 1979, 54-95339

Int. Cl.[3] G01D *15/10, 9/42*

U.S. Cl. 346—76 L 2 Claims



1. A device for correcting pitch of scanning lines in a light beam recording system in which a light beam is horizontally deflected by a horizontal deflecting means and vertically deflected by a vibrating mirror, the horizontally deflected light beam scans a linear encoder to generate a photoelectric pulse signal, the number of the photoelectric pulses is counted to detect the position of the deflected light beam, the signal representing the vertically deflected position is inputed into a vibrating mirror driving circuit to rotate said vibrating mirror by predetermined angles, and the light beam thus horizontally and vertically deflected records an image of information on a recording material by raster scanning wherein the improvement comprises an optical mark provided on said linear encoder in the vicinity of the end of the raster scanning to receive a number of scanning lines, means for counting the number of the scanning lines received by said optical mark to detect fluctuation in the amplitude of said vibrating mirror, and means for controlling the gain of said vibrating mirror driving circuit according to the detected fluctuation.

4,323,907
VALVE FOR INK JET PRINTER

Victor J. Italiano, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 2, 1980, Ser. No. 108,984

Int. Cl.[3] G01D *15/18*

U.S. Cl. 346—140 R 15 Claims

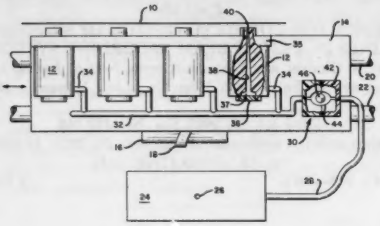
1. A control system for an ink jet print head movable in bidirectional printing manner and having ink drive means for ejecting an ink droplet through a nozzle in the print head, said system comprising a

stationary ink reservoir, an

ink supply line connected with said ink reservoir and with said print head, and

valve means having an inlet port and an outlet port and movable with said print head and interposed in said ink supply line and responsive upon acceleration and deceleration of said print head to open and close said ports wherein said ink supply line is closed on one side of said valve means when said print head is decelerated and accelerated at one end of travel, and said ink supply line is closed on the other side of said valve means when said

print head is decelerated and accelerated at the other end of travel of the print head by reason of the inertial forces acting on said valve means, and said ink supply line is open



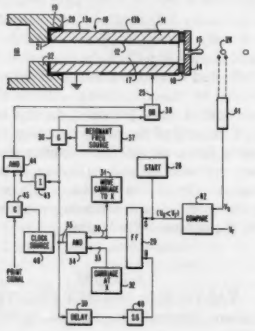
on both sides of said valve means from the reservoir to the print head during printing operation when said print head is moving at printing speed.

4,323,908

RESONANT PURGING OF DROP-ON-DEMAND INK JET PRINT HEADS

Francis C. Lee, San Jose; Ross N. Mills, and Frank E. Talke, both of Morgan Hill, all of Calif., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 1, 1980, Ser. No. 174,335
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **7 Claims**



1. A method of purging air from an ink-containing cavity in the print head of a drop-on-demand ink jet device, comprising the steps of:

providing a transducer in operative relationship with ink in the cavity,

energizing the transducer continuously, during purging time, with a series of pulses of at least a predetermined amplitude without application of supplemental pressure to the ink, said series of pulses being applied for a preselected period of time and at a repetition rate substantially equal to at least one resonant frequency of the cavity to purge any entrapped air from the cavity, and

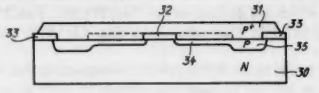
thereafter, during printing time, energizing the same transducer with asynchronous pulses in a drop-on-demand mode at a frequency lower than any such resonant frequency.

4,323,909

PLANAR AVALANCHE DIODE WITH A BREAKDOWN VOLTAGE BETWEEN 4 AND 8 VOLTS

Henri Valdmann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 15, 1980, Ser. No. 140,486
Claims priority, application France, Apr. 20, 1979, 79 10065
Int. Cl.³ H01L *29/90*
U.S. Cl. 357—13 **8 Claims**



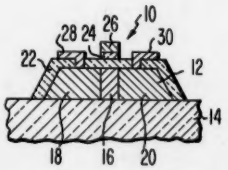
1. A planar avalanche diode with a breakdown voltage between 4 and 8 volts incorporating a silicon substrate of a first conductivity type coated with a silica mask through which there is a diffusion to supply a layer of a second conductivity type opposite to the first, the perimeter of the diffused zone being surrounded by a deeper diffusion zone, wherein the said mask blocks the diffusion in a region within the said perimeter and at least that part of the mask within the said perimeter is covered with a protective layer.

4,323,910

MNOS MEMORY TRANSISTOR

Joseph C. Sokoloski, East Brunswick, and Alfred C. Ipri, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 28, 1977, Ser. No. 855,087
Int. Cl.³ H01L *29/80*
U.S. Cl. 357—23 **7 Claims**



1. A MNOS memory transistor comprising:

a body of semiconductor material having along a surface thereof a source region, a drain region, and a channel region between said source and drain regions,

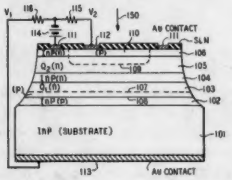
a channel insulation on said surface of the semiconductor body and over said channel region, said channel insulation including two layers of different material which are capable of storing at the interface electrons which are injected into the channel insulation, and

said channel being sufficiently narrow in width that the electrons will be injected into the channel insulation completely across the channel region by avalanche injection.

4,323,911
DEMULTIPLEXING PHOTODETECTORS

Joe C. Campbell, Middletown, and Tien P. Lee, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 969,346, Dec. 14, 1978, Pat. No. 4,213,138. This application Mar. 7, 1980, Ser. No. 127,942
The portion of the term of this patent subsequent to Jul. 15, 1997, has been disclaimed.
Int. Cl.³ H01L *27/14, 29/161*
U.S. Cl. 357—30 **4 Claims**

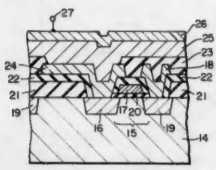


1. A demultiplexing photodetector comprising an indium phosphide substrate, a bottom indium phosphide layer of one conductivity type epitaxially grown on said substrate, a plurality of semiconductor layers including a top layer all of the opposite conductivity type epitaxially grown on said bottom layer, and a region of said top semiconductor layer being doped such that said region is of said one conductivity type characterized in that said plurality of semiconductor layers includes a first quaternary layer having a first bandgap and being epitaxially grown on said bottom indium phosphide layer, said first quaternary layer having a diffused pn junction within the layer, at least one barrier layer epitaxially grown on said first quaternary layer, a second quaternary layer having a second bandgap potential and being epitaxially grown on said barrier layer, said second quaternary layer having a diffused pn junction within the layer created by said region of said one conductivity type, said barrier layer having a bandgap higher than either of said quaternary layers, and said photodetector further includes an electrode means for independently coupling potentials to the pn junctions in each of said quaternary layers.

4,323,912
SOLID-STATE IMAGING DEVICE

Norio Koike; Toshihisa Tsukada, both of Tokyo; Haruhisa Ando; Hideaki Yamamoto, both of Hachioji; Tadaaki Hirai, Koganei; Masaharu Kubo, Hachioji; Eiichi Maruyama, Kodaira; Toru Baji, Kikubunji; Yukio Takasaki, and Shusaku Nagahara, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,690
Claims priority, application Japan, Jun. 4, 1979, 54-68970
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—31 **5 Claims**

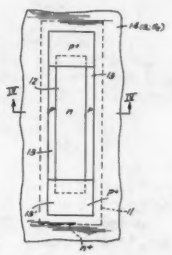


1. In a solid-state imaging device having a semiconductor integrated circuit in which a plurality of switching elements for addressing positions of picture elements and scanning circuitry for turning the switching elements "on" and "off" in time sequence are disposed on an identical substrate, a photoconductive film which is disposed on the integrated circuit and which is connected with the respective switching elements, and a light transmitting electrode which is disposed on the photoconductive film, a voltage being applied to the light transmitting electrode thereby to bias a region of the photoconductive film on a light entrance side either positively or negatively with respect to a region thereof on the opposite side; a solid-state imaging device characterized in that said each switching element is an element which uses carriers of a polarity opposite to that of carriers having a greater mobility in said photoconductive film.

4,323,913
INTEGRATED SEMICONDUCTOR CIRCUIT ARRANGEMENT

Helmuth Murrmann, Ottobrunn; Ronald Rathbone, Taufkirchen, and Ulrich Schwabe, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 867,429, Jan. 9, 1978, abandoned, which is a continuation of Ser. No. 664,872, Mar. 8, 1976, abandoned. This application Oct. 17, 1979, Ser. No. 85,735
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1975, 2510593
Int. Cl.³ H01L *27/04*; H01C *7/00*
U.S. Cl. 357—51 **2 Claims**



1. An integrated semiconductor circuit arrangement comprising: a semiconductor substrate of a first conductivity type; a semiconductor epitaxial layer of a second conductivity type on one surface of said substrate; oxide walls extending through said epitaxial layer to said substrate separating said epitaxial layer into isolated sections;

at least one of said isolated sections having spaced generally parallel sidewalls terminating in spaced end walls; first and second regions of said first conductivity type lining said oxide walls along said generally parallel sidewalls;

a third region of said first conductivity type located at one of said end walls, said third region having a lower resistivity than said first and second regions and being in electrical contact with said first and second regions; means of said first conductivity type in contact with said first and second regions at the one of said end walls spaced from said third region; and

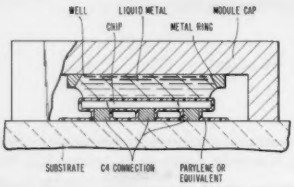
said first and second regions being separated from each other by the second conductivity type material of said at least one of said isolated sections except at said end walls,

whereby said first and second regions form a resistor element between said means in contact therewith and said third region.

4,323,914
HEAT TRANSFER STRUCTURE FOR INTEGRATED CIRCUIT PACKAGE

Erich Berndlmaier, Wappingers Falls; Bernard T. Clark, Poughquag, and Jack A. Dorler, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1979, Ser. No. 8,375
Int. Cl.³ H01L 25/04
U.S. Cl. 357—82 **3 Claims**



1. In an integrated circuit assembly including:

at least one semiconductor chip on a circuitized substrate with a cover mounted on said substrate to enclose said semiconductor chip;

said chip and said circuitized substrate being electrically connected one to the other by a plurality of discrete solder connections;

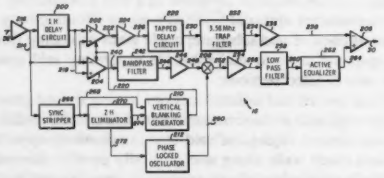
a formable electrically insulative film in physical contact with said chip and enclosing a thermally conductive material between said film and the underside of said cover, said formable electrically insulative film is a non-conductive protective film of vapor deposited parylene, said thermally conductive material enclosed between said film of vapor deposited parylene and the underside of said cover is a liquid metal and said liquid metal includes at least one selected from the group of Gallium, Indium and mercury,

said assembly being characterized by the provision of said non-conductive vapor deposited parylene protective film encompassing each of said solder connections.

4,323,915
METHOD AND AN APPARATUS FOR VIDEO TAPE RECORDING

Robert M. Cezar, and Alberto B. Paz, both of Sunnyvale, Calif., assignors to Cezar International, Ltd., Sunnyvale, Calif.

Filed Apr. 11, 1980, Ser. No. 139,238
Int. Cl.³ H04N 5/76, 9/42
U.S. Cl. 358—4 **7 Claims**



1. An apparatus for developing an encoded-color signal suitable for recordation as a monochrome signal by a video tape recorder from a standard color-television signal, the apparatus comprising in combination:

filter means for separating the standard color-television signal to develop a signal representing the chrominance portion thereof and a signal representing the remainder thereof, said filter means including means for delaying said standard color-television signal one horizontal period thereof to develop a delayed signal, means for combining out of phase said standard color-television signal and said delayed signal to develop said separated chrominance signal and means for combining in phase said standard color-television signal and said delayed signal to develop said remainder signal;

phase-locked-oscillator means for developing a local-oscillator signal having a frequency which is locked to an even multiple of the half-horizontal frequency of said standard color-television signal;

mixer means coupled to said filter means and said phase-locked-oscillator means, said mixer means for combining said separated chrominance signal with said local-oscillator signal to develop a hetrodyned chrominance signal the spectrum of which lies substantially within the monochrome bandwidth of the video tape recorder;

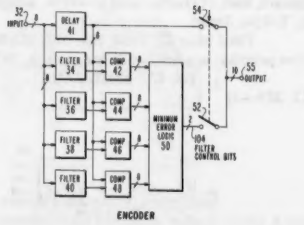
signal-adder means coupled to said filter means and said mixer means, said signal adder means for combining said remainder signal and said hetrodyned chrominance signal to develop the encoded-color signal; and

gating-signal-generating means coupled to said filter means, said gating-signal-generating means being responsive to said standard color-television signal and operative to develop a gating signal during the vertical-retrace period thereof, and wherein said out-of-phase-combining means is responsive to said gating signal and operative to inhibit development of said separated chrominance signal during said vertical-retrace period and wherein said in-phase-combining means is responsive to said gating signal and operative to inhibit development of said remainder signal during said verical-retrace period.

4,323,916
DATA RATE REDUCTION FOR DIGITAL VIDEO SIGNALS BY SUBSAMPLING AND ADAPTIVE RECONSTRUCTION

Robert A. Dischert, Burlington, and Glenn A. Reitmeier, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 132,137, Mar. 20, 1980, abandoned.
This application Jul. 14, 1980, Ser. No. 168,077
Claims priority, application United Kingdom, Feb. 7, 1980, 04195/80
Int. Cl.³ H04N 9/32
U.S. Cl. 358—13 **29 Claims**

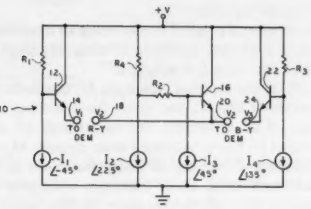


1. A method of transmitting data divided into first and second portions, each portion comprising a plurality of bytes, said method comprising transmitting said first portion, comparing at least one byte of the remaining untransmitted second portion to a plurality of selected combinations of bytes of said first portion, determining which of said selected combinations of bytes of said first portion is the closest match to said one byte of said second portion, and transmitting a control byte indicative of said closest match.

4,323,917
TINT CONTROL

Christopher M. Engel, Arlington Heights, and Daniel L. Reneau, Elmhurst, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 17, 1980, Ser. No. 197,861
Int. Cl.³ H04N 9/535
U.S. Cl. 358—28 11 Claims



1. A tint control for use in a color television receiver, comprising:

means for generating first, second, third and fourth currents having substantially equal D.C. components and having respective color subcarrier A.C. components of four different quadrature phases, which phases are each variable over a selected range; and

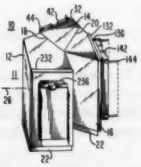
means for coupling said currents to loads to develop three voltages, V_1, V_2 and V_3 having substantially equal D.C. components, having phases and amplitudes such that the angular difference between a vector corresponding to V_1-V_2 and a vector corresponding to V_3-V_2 is greater than 90 degrees, and such that said angular difference remains substantially constant as the phases of the A.C. components of said four currents are varied over the selected range,

whereby voltages corresponding to V_1-V_2 and V_3-V_2 are adapted to be D.C. coupled to a pair of color demodulators for demodulating color signals at a relative angle other than 90 degrees.

4,323,918
OPTICAL ASSEMBLY FOR COLOR TELEVISION

Sidney L. Bendell, Riverton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 25, 1980, Ser. No. 180,897
Int. Cl.³ H04N 9/09
U.S. Cl. 358—50 13 Claims



1. An improved color television camera arrangement comprising:

rigid optical light-splitting means having a light input port and a plurality of light output ports to which light passes from said input port;

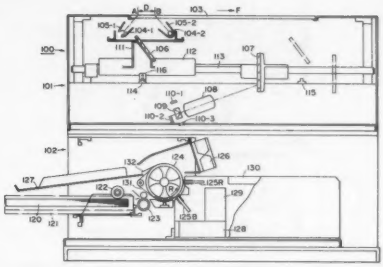
a plurality of transducers coupled to said output ports for generating electrical signals in response to said light;

wherein the improvement lies in that a portion of said plurality of transducers is bonded in a fixed position by a single-phase adhesive to a corresponding portion of said plurality of said output ports.

4,323,919
OPTICAL SCANNER FOR READING DATA RECORDED IN PLURAL COLORS

Motoharu Fujii, Tokyo; Noboru Koumura, Narashino; Naoki Ayata, Yokohama; Seiji Saito, Yokosuka, and Yasushi Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1980, Ser. No. 173,890
Claims priority, application Japan, Aug. 9, 1979, 54-101675; Aug. 9, 1979, 54-101676
Int. Cl.³ H04N 1/46
U.S. Cl. 358—75 7 Claims



1. A reader of the type in which an information bearing surface is optically scanned relatively in reciprocating motion to read the color informations on said surface, said reader comprising:

means for irradiating said information bearing surface by light;

optical separation means for separating the light coming from said information bearing surface into light of a long wavelength side and light of a short wavelength side; and

reading means having three photoreceptor elements of which the first and third elements are disposed to receive said light of long wavelength side and the second one is disposed to receive said light of short wavelength side and arranged for discriminating one of said color informations by said first photoreceptor element and the other color information by said second and third photoreceptor elements thereby producing electric output signals corresponding to the respective color informations.

4,323,920
STEREOSCOPIC TELEVISION (UNAIDED WITH LIP SYNC) ON STANDARD BANDWIDTH-METHOD AND APPARATUS

Robert B. Collender, 709 Patterson Ave., Glendale, Calif. 91203

Filed May 19, 1980, Ser. No. 150,982
Int. Cl.³ H04N 9/54
U.S. Cl. 358—88 7 Claims

1. A method of stereoscopically reproducing television signals for observation by a plurality of observers without a need for visual aids at said observers eyes, comprising the following steps:

acquiring two views of a scene; synthesizing N views at a receiver between said two views;

placing N+2 frames or fields on an array of N+2 images;

scanning said image array by a scan projector having one or more identical facets;

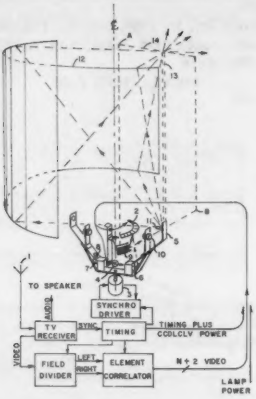
causing any image of said image array to store a whole television field or frame during a scan interval by any single facet of said scan projector;

causing all images in said image array to advance to a next sequential television field or frame during a period between scans by adjacent facets of said scan projector;

projecting sequentially said images of said array onto a

semispecular screen, said scan projector being positioned during projection at successive positions about an arc of a projection circle, said screen being of larger radius compared with said projection circle;

causing said screen to vertically scatter and horizontally reflect incident light from said scan projector;



causing said reflected incident light from said screen to intersect on a line essentially tangent to said projection circle;

causing said intersected light to move along said line;

causing said scan projector interval between scans by adjacent facets to be within the period of persistence of vision of said observers.

4,323,921

SYSTEM FOR TRANSMITTING INFORMATION PROVIDED WITH MEANS FOR CONTROLLING ACCESS TO THE INFORMATION TRANSMITTED

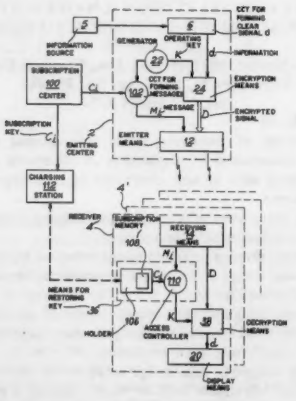
Louis C. Guillou, Bourgbarre, France, assignor to Etablissement Public de Diffusion dit "Telediffusion de France", Montrouge and L'Etat Francais, represente par le Secretaire d'Etat aux Poste et Telecommunications (Centre National d'Etudes des Telecommunications), Issy les Moulineaux, both of, France

Filed Jan. 23, 1980, Ser. No. 114,555

Claims priority, application France, Feb. 6, 1979, 79 02995

Int. Cl.³ H04L 9/00

U.S. Cl. 358—114 **5 Claims**



1. A system for transmitting information between an emitting center and receiving stations, the emitting center comprising a circuit for forming signals carrying said information and means for emitting said signals, each receiving station comprising means for receiving the signals transmitted and means for displaying the information, wherein it also comprises:

(A) a subscription administration center generating a plurality of signals constituting subscriber's keys C_i, these subscriber's keys changing randomly at relatively long intervals of the order of a month;

(B) in the emitting center:

(a) a generator of a signal constituting an operating key K, this key changing randomly at relatively short intervals of the order of a few minutes,

(b) a circuit for forming messages M_i obtained from said subscriber's keys C_i and from the operating key K by means of an algorithm the parameters of which are provided by the subscriber's keys, namely $M_i = F_{Ci}(K)$, this circuit delivering as many messages as there are subscriber's keys, these messages changing with the operating key, all the messages M_i then being directed towards the emitter means,

(c) an automatic encryption means using the operating key K, this automatic means receiving signals carrying the information and delivering encrypted signals which are then directed towards the emitter means,

(c) in each receiving station:

(a) a subscription holder on which is recorded a signal corresponding to at least one of the subscriber's keys C_i,

(b) a circuit for restoring the operating key, receiving on the one hand the messages M_i received and, on the other hand, the subscriber's key C_i, this circuit working out an algorithm $K = G_{Ci}(M_i)$ for restoring the signal corresponding to the operating key K used in the emitting station from the messages M_i received and from the subscriber's key C_i,

(c) an automatic decryption means which is connected, on the one hand, to the receiving means from which it receives the encrypted signals and, on the other hand, to the restoring circuit from which it receives the operating key K, this automatic means decrypting the encrypted signals, by using the operating key, and delivering decrypted signals which are then directed towards the information display means,

(D) at least one charging station for the subscription holders, this station being connected to the subscription administration center from which it receives the signals corresponding to the different subscriber's keys C_i generated by this center, each station being capable of temporarily receiving the subscription holders and permanently recording one of the subscriber's key C_i thereon.

4,323,922

TELEVISION CODING SYSTEM WITH CHANNEL LEVEL IDENTIFICATION

Pieter den Toonder, Dordrecht, Netherlands; Glenn P. Doles, Wonder Lake, Ill.; John A. Lund, McHenry Shore's, Ill.; Richard G. Merrell, Hebron, Ill., and Graham S. Stubbs, Poway, Calif., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Dec. 17, 1979, Ser. No. 104,147

Int. Cl.³ H04N 7/16

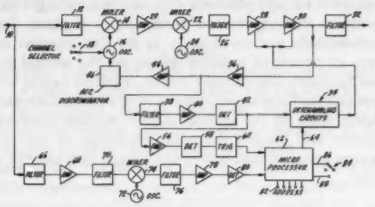
U.S. Cl. 358—117 **12 Claims**

5. A method of authorizing the presentation of electrically transmitted intelligence to separate subscribers including the steps of:

(a) transmitting an RF intelligence signal, which signal includes data as to the classification of said intelligence signal,

(b) transmitting, at a frequency distinct from said RF signal and along the some signal path as said RF signal, an authorization signal, which includes data as to the type of signal authorized for particular subscribers,

(c) comparing the authorization data and classification data, and



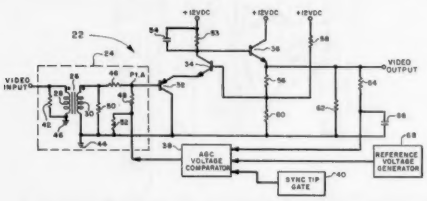
(d) presenting said transmitted intelligence in an understandable form upon correspondence between said separately transmitted classification data and authorization data.

4,323,923

AGC-CLAMPED VIDEO AMPLIFIER

Daniel L. Reneau, Elmhurst, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 6, 1980, Ser. No. 194,170
Int. Cl.³ H04N 5/16
U.S. Cl. 358—171 **10 Claims**



1. In a video display of a television receiver including a source of video signals having a given received signal amplitude, said video signals including horizontal and vertical sync pulses for synchronizing television receiver horizontal and vertical scan with said video signals, and automatic gain control for comparing horizontal sync pulse voltage level with a reference voltage level and for generating an automatic gain control signal for adjusting video signal DC voltage level, a video feedback amplifier coupled to said source of video signals for amplifying and maintaining said video signals at a first predetermined voltage level, said video feedback amplifier comprising:

signal level shifting means coupled to said source of video signals for receiving said video signals and for adjusting said video signals to a second predetermined voltage level;

amplifier means coupled to said level shifting means for receiving and amplifying said level-shifted video signals to generate video output signals; and

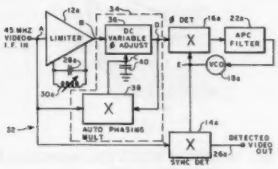
clamping means coupled in a feedback configuration to said amplifier means for receiving said video output signals, comparing the horizontal sync pulse level of said video output signals to said reference voltage level and for clamping a predetermined point of said amplifier means to a correction voltage produced by the comparison of said horizontal sync pulse level with said reference voltage level in controlling vertical sync pulse level in synchronizing television receiver vertical scan with said received video signals.

4,323,924

AUTOMATIC PHASE ADJUSTING CIRCUIT FOR A SYNCHRONOUS DETECTOR

Michael D. Flasza, Schaumburg, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 6, 1980, Ser. No. 194,169
Int. Cl.³ H04N 5/44
U.S. Cl. 358—188 **9 Claims**



1. In a television receiver which develops a video I.F. signal and which has a phase locked loop for developing an oscillator signal whose phase tracks with the variations in the phase of the video I.F. signal, and a synchronous detector receiving the video I.F. signal and the oscillator signal for demodulating the video I.F. signal, a phasing circuit for automatically controlling the phase of the oscillator signal relative to the video signal input to the synchronous detector, comprising:

means including a phase adjustment network for coupling the video I.F. signal to the phase locked loop and for varying the phase of the latter signal input to the phase locked loop on a continuously variable basis in response to a phase correction signal; and

means sensing the video I.F. signal and the video input to the phase locked loop for developing and coupling to the phase adjustment network a phase correction signal such that the latter network varies the phase of the video I.F. input to the phase locked loop until the phase of the oscillator signal has a selected phase relationship to the video I.F. signal input to the synchronous detector.

4,323,925

METHOD AND APPARATUS FOR ARRAYING IMAGE SENSOR MODULES

Gurdon R. Abell, West Woodstock, Conn.; Francis J. Cook, Topsfield, and Peter D. Howes, Sudbury, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Jul. 7, 1980, Ser. No. 166,922
Int. Cl.³ H04N 3/15; H01L 27/14
U.S. Cl. 358—213 **30 Claims**

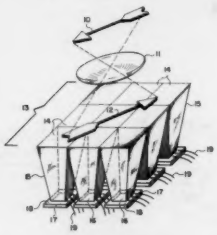
1. An electrical-output optical image sensor for a two-dimensional optical image composed of an arrayed plurality of contiguous two-dimensional optical sub-images bearing light energy, said sensor comprising:

an image surface for receiving said two-dimensional optical image and transmitting a portion of the light energy of each said two-dimensional optical sub-image as a corresponding two-dimensional sub-image-bearing flux;

an arrayed plurality of minifying means including two-dimensional minified sub-image surfaces and corresponding in number and arrangement to said plurality of contiguous two-dimensional optical sub-images, said minifying means receiving and transmitting each said two-dimensional sub-image-bearing flux in image-coherent geometrically reduced form as a corresponding two-dimensional mini-

fied sub-image-bearing flux incident upon and through a corresponding said two-dimensional minified sub-image surface; and

arrayed flux-sensitive electrical-output image sensor modules, each having a flux-sensitive two-dimensional image-



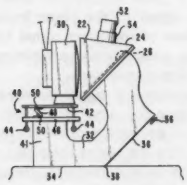
input surface in register with a corresponding two-dimensional minified sub-image surface and receiving a corresponding two-dimensional minified sub-image-bearing flux, and having electrical means for converting said two-dimensional minified sub-image-bearing flux into a corresponding pattern of electrical signals.

4,323,926

TELEVISION PROJECTOR APPARATUS

Ira J. Newman, 6903 NW. 95th Ter., Tamarac, Fla. 33321

Filed Jan. 25, 1980, Ser. No. 115,377
Int. Cl.³ H04N *5/74*
U.S. Cl. 358—237 **4 Claims**



1. An apparatus for projecting an enlarged image from the viewing screen of a television receiver mounted therein, comprising:

a housing including a base, a pair of upstanding side walls, an inclined front wall, and a window opening for receiving the viewing screen of said television receiver, said base and front wall forming first and second support surfaces contained in respective intersecting planes which together form an obtuse angle, the window opening being contained in a plane substantially perpendicular to the plane containing the first support surface;

a mirror located within said housing and disposed between said side walls, said mirror being contained in a plane substantially parallel to the plane containing the second support surface;

a platform attached to said base of said housing for supporting the television receiver with its viewing screen received in said window opening in a position oriented toward said mirror, said platform being adjustable in height and angle to accommodate television receivers with differently sized viewing screens and/or with viewing screens disposed at different heights and/or different angles relative to the plane containing the receiver base and/or disposed above, below or to one side of the controls;

a projector lens means mounted on said front wall of said housing for receiving an image reflected by said mirror from said viewing screen and for projecting an enlargement of said image; and

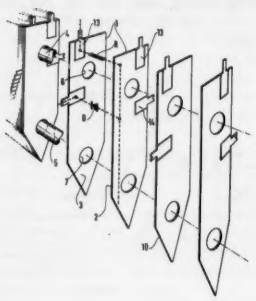
said base of said housing being adapted to tilt from the first support surface wherein when a television receiver is mounted on said platform disposed in an upright position with its viewing screen contained in a plane disposed substantially perpendicularly to the first support surface into an operative position resting on the second support surface with the viewing screen received in the window opening and the screen contained in a plane disposed at an acute angle to the second support surface whereby said mirror will project the enlarged image of the viewing screen through said projection means in a desired direction.

4,323,927

BAR FOR PRINTING AN IMAGE

Marcel Yvard, Ollainville; Jean-Claude Decuyper, Elancourt, and Michel Beduchaud, Villebon Sur Yvette, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Continuation of Ser. No. 914,177, Jun. 9, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,517
Claims priority, application France, Jun. 13, 1977, 77 18011
Int. Cl.³ H04N *1/24*
U.S. Cl. 358—296 **14 Claims**



1. A bar for printing an image on sensitive paper by scanning said paper along successive lines, comprising a stack of thin, electrically-conductive plates which are insulated one from the other, each of said plates having a first end which comprises a printing stylus, said printing styli being disposed along a scan line at the pitch of the printing dots there along, and n diagonal diode matrices for addressing said styli, the columns of said plates which are divided into n sets corresponding to the n matrices, the rows of said matrices being common to all n matrices and comprising at least one network of electrical conductors, and wherein in each of said n matrices:

the columns of said matrix are connected to and fed by a first feed terminal via a corresponding plurality of resistances (R), one first feed terminal being associated with each of said n matrices;

each of said resistances (R) comprises a thin leaf of resistive material in substantially intimate, co-planar electrical contact with one of said plates and with a first contact terminal inserted in this plate or in an adjacent plate, said first contact terminal being insulated from the plate into which it is inserted and being electrically connected to said first feed terminal;

the rows of said matrix are connected to said plates via a corresponding plurality of electrical diodes (D) individually controlled from a plurality of second feed terminals equal in number to the number of rows in said matrix; and

each of said diodes (D) comprises a thin leaf of semi-conductive material in substantially intimate, co-planar electrical

contact with one of said plates and with a second contact terminal inserted in this plate or in an adjacent plate, said second contact terminal being insulated from the plate in which it is inserted and being electrically connected to one of the conductors in said network of conductors.

4,323,928
COPYING PROCESS FOR PRODUCING A SEAMLESS COPY FROM AN UNJOINTED ORIGINAL

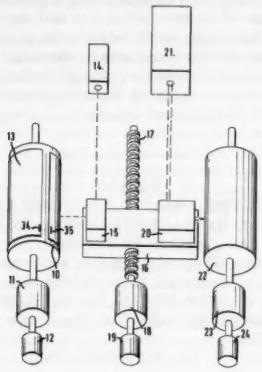
Peter M. Zollman, Walton-on-Thames, and Keith G. Doyle, Sunbury-on-Thames, both of England, assignors to Zed Instruments Limited, West Molesey, England

Division of Ser. No. 967,841, Dec. 8, 1978, Pat. No. 4,232,345, which is a continuation-in-part of Ser. No. 928,410, Jul. 27, 1978, abandoned, which is a continuation of Ser. No. 805,980, Jun. 13, 1977, abandoned. This application Jun. 3, 1980, Ser. No. 156,105

Claims priority, application United Kingdom, Jun. 11, 1976, 24350/76; Jun. 23, 1976, 26126/76

Int. Cl.³ H04N *1/22, 1/26, 1/38*

U.S. Cl. 358—299 **9 Claims**



1. A copying process for producing a seamless, jointed copy from an unjointed original, said process comprising mounting the original on a first rotary carrier with a circumferential gap between the leading and trailing edges of the original, rotating the first carrier, initially scanning the original to measure the circumferential length of the original, continuing scanning of the original and storing the data obtained during the scan in a store, reading data from the store and modulating a power laser in accordance with the data read from the store, providing a second rotary carrier and rotating the second rotary carrier, directing the modulated laser beam towards the second rotary carrier to scan and engrave a laser-engravable surface of the second ratory carrier, and controlling the store according to the length measured in initially scanning the original to ensure that each scan of the second carrier is filled by data from the original outside the gap.

4,323,929
PRINTING PROCESS USING LITHOGRAPHIC PLATES MADE FROM TONED AMPLITUDE MODULATED MAGNETIC IMAGES

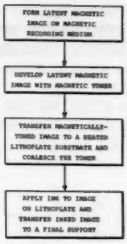
George R. Nacci, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1979, Ser. No. 98,987

Int. Cl.³ H04N *1/28*

U.S. Cl. 358—301 **8 Claims**

1. A printing process comprising forming a latent magnetic image in a magnetic recording medium which is at least 100 μm thick by applying electric wave recording signal to a magnetic recording head with the amplitude of said signal a function of the optical density of the desired image, said magnetic recording head having a width between about 0.5 mil and 5 mils; causing said magnetic recording head to repeatedly traverse the magnetic record medium in a series of aligned parallel paths to form the latent magnetic image in the magnetic recording medium with the distance between the centers of the parallel paths being from about 1.2 to 2 times the width of the recording head and with a horizontal spatial frequency of from about 200 to 1000 cycles/in; decorating the latent magnetic image with oleophilic magnetic toner particles comprising magnetic particles, encapsulated in a coalescible polymer binder, having an average size of from about 2 to about 7 μm, dispersed in a liquid vehicle, thereby forming a decorated


FORM LATENT MAGNETIC IMAGE ON MAGNETIC RECORDING MEDIUM
DEVELOP LATENT MAGNETIC IMAGE WITH MAGNETIC TONER
TRANSFER MAGNETICALLY-TONED IMAGE TO A HEATED LITHOPLATE SUBSTRATE AND COALESCE THE TONER
APPLY INK TO IMAGE ON LITHOPLATE AND TRANSFER INKED IMAGE TO A FINAL SUPPORT

image; rinsing said toned image with a liquid; drying said decorated image; bringing said toned image into momentary contact under pressure with a heated rigid, smooth lithoplate substrate having a roughness of less than about 10 μ inches, whereby said toner particles are transferred to said heated substrate to form an image of at least partially coalesced toner particles on said substrate; further coalescing said image if necessary thereby forming a lithographic printing plate which accepts ink in the toned areas containing the ink receptive polymer but does not accept ink in the areas free of toner; applying ink to said lithoplate; and transferring the ink to a final support.

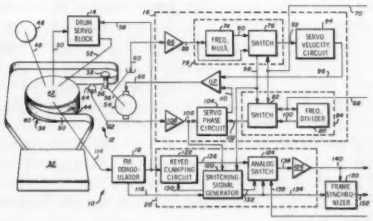
4,323,930
SLOW MOVING VIDEO TAPE REPRODUCTION

David T. L. Chang, Palo Alto, Calif., assignor to Recortec, Inc., Mountain View, Calif.

Filed Oct. 6, 1980, Ser. No. 194,008

Int. Cl.³ H04N *5/78*

U.S. Cl. 360—10 **11 Claims**



1. A video tape reproducer for developing a video signal representing in slow motion a signal previously encoded and recorded upon a plurality of video tracks on a length of magnetic recording tape in a helical-scan format wherein each field of the encoded signal is divided into a plurality of segments each recorded upon a respective one of the tracks of the tape, the reproducer comprising in combination:

scanner means including means for reproducing each one of the segments of the encoded signal which is recorded upon a corresponding one of the video tracks that is drawn past said scanner means;

capstan means for drawing said tape past said scanner;
means for rotating said capstan means at a rate wherein said one of said segments of said encoded signal is reproduced a plurality of times in succession;
means for decoding said segments of said encoded signal which are reproduced by said scanner means to develop corresponding segments of a decoded signal; and
switching means for developing the slow-motion signal by combining a one of each plurality of segments of said decoded signal which correspond to a unique one of said tracks with a black-level video signal.

4,323,931

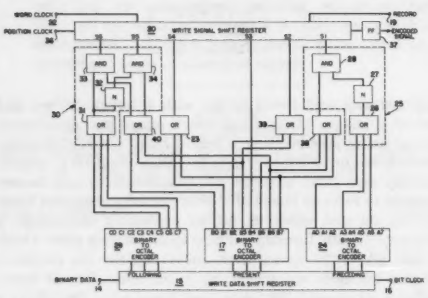
METHOD AND APPARATUS FOR ENCODING AND RECOVERING BINARY DIGITAL DATA

George V. Jacoby, Los Altos, Calif., assignor to Sperry Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 705,199, Jul. 14, 1976. This application Jul. 3, 1980, Ser. No. 165,562

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—40 **40 Claims**



1. Apparatus for converting binary data in the form of a series of data bits occurring at spaced intervals to a series of signal changes each located at a discrete selected signal change position of a plurality of signal change positions that are spaced from one another by an increment such that the selected signal change positions are spaced relative to one another at least a prescribed minimum amount greater than the increment, said apparatus comprising: data storage means for receiving the binary data and grouping data bits to form a plurality of data words, code signal generating means coupled to the data storage means and responsive to the data words for generating code signals each of which corresponds to a signal change, and means coupled to said code signal generating means and responsive to code signals generated thereby for merging plural code signals that correspond to signal changes at divers signal change positions spaced from one another less than the prescribed minimum amount into at least one code signal corresponding to a signal change at a signal change position different from said divers signal change positions such that all signal changes are spaced from one another by at least the prescribed minimum amount.

4,323,932

READBACK PULSE COMPENSATOR

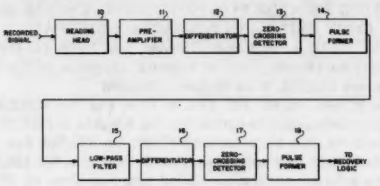
Jules A. Eibner, Maple Glen, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 30, 1979, Ser. No. 62,279

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—45 **18 Claims**

1. In a system for processing a first signal which has consecutive opposite-polarity peaks corresponding to information represented by transitions in a data bearing medium, and in which the said signal peaks are subject to misalignment with respect to the corresponding data transitions, the improvement which comprises:
means for producing a second signal from said first signal, which second signal has peaks with substantially the same said misalignment but of the same polarity;
means for subjecting the produced second signal to low-pass filtering; and



means for deriving from said low-pass filtering means a third signal having peaks substantially in alignment with respective peaks of the same polarity in said second signal;
whereby the misalignment between the peaks of the third signal and the data transitions is substantially less than the misalignment between the peaks of the first signal and the data transitions, reducing the misalignment between the data and the processed signal which is representative of said data.

4,323,933

DEVICE FOR ERASING A RECORD CARRIER RECORDED BY MAGNETIC FIELDS IN VISUALLY READABLE FORM

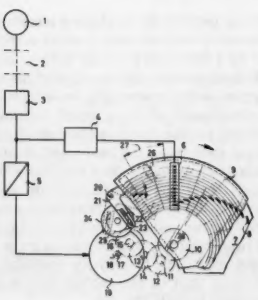
Manfred Fichter, Königsfeld, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Oct. 29, 1979, Ser. No. 89,257

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 2847682

Int. Cl.³ G11B *5/02*

U.S. Cl. 346—74.3 **4 Claims**



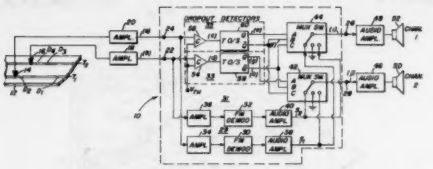
1. In combination with a record carrier modifiable by magnetic fields wherein a magnetic recording means allows visually readable recordings of measured values and wherein drive means are used to drive a measuring device associated with said record carrier, an erasing device comprising at least one erasing magnet positioned directly on top of the record carrier and movable transverse to the transport direction of said record carrier so that the magnetic axis of said magnet is parallel to the plane of the record carrier, the movement of the erasing magnet being effective essentially in the direction of the magnetic axis wherein a permanent magnet is used as the erasing magnet; and a carrier for the erasing magnet, said carrier being in driving connection with the driving means of the measuring device.

4,323,934

DROPOUT COMPENSATION CIRCUITRY

Andre Giraud, Champigny sur Marne, France, assignor to Spin Physics, Inc., San Diego, Calif.

Filed Mar. 27, 1980, Ser. No. 134,403
Int. Cl.[3] G11B 15/12, 5/02
U.S. Cl. 360—61 5 Claims



1. In an apparatus for translating a plurality of carrier-modulated, correlated input signals which occur simultaneously at a plurality of input terminals into corresponding output signals at a plurality of output terminals, the improvement comprising:

(a) means responsive to the carrier components of each of said input signals for continuously providing a plurality of control signals indicating the presence or absence of said input signals; and

(b) switching means responsive to said control signals and operable in a first state for selectively coupling said output signals to the output terminals therefor while the input signals to which said output signals correspond are present, and operable in a second state for selectively coupling said output signals to the output terminals for other of said output signals during the absence of the input signals to which said other output signals correspond,

said apparatus having a plurality of separate translation channels between each of said input and output terminals, one channel for each of said plurality of input signals and the output signal corresponding thereto, said switching means being connected in each of said channels for coupling said output signals to the output terminals therefor, and said means for providing said control signals being a plurality of control circuits separately connected between said input terminals and said switching means, and said control circuits each comprising means for detecting the absence or presence of the carrier component of said input signals for providing a separate one of said control signals, each of said detecting means comprising a comparator responsive to the amplitude of each cycle of the carrier component of the input signal applied thereto, and a one shot multivibrator triggerably connected to said comparator, said one shot multivibrator producing a pair of output levels which provide one of said plurality of control signals and represent the absence and presence of one of said plurality of input signals.

4,323,935

NONPROGRAM SECTION DETECTION MECHANISM IN A CASSETTE TAPE PLAYER

Satoru Koizumi; Takashi Shimamura, and Sadao Uchiyama, all of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 15, 1979, Ser. No. 95,083
Claims priority, application Japan, Nov. 15, 1978, 53/140894; Nov. 15, 1978, 53/140895
Int. Cl.[3] G11B 15/44, 19/26, 27/22
U.S. Cl. 360—73 15 Claims

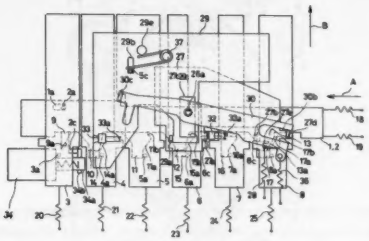
1. A nonprogram section detection mechanism in a cassette tape player comprising:

nonprogram section detection circuit means for locating a nonprogram section interposed between two adjacent programs recorded on a magnetic tape;

playback instruction means for conducting a reproduction operation of information recorded in said programs on the magnetic tape while the magnetic tape is driven to travel at a normal playback speed, said playback instruction means including a slidable subchassis, a magnetic reproduction head mounted on said subchassis, and a playback actuating means connected to said subchassis for sliding said subchassis and said magnetic reproduction head in one direction from a first position to a second position when actuated;

fast movement instruction means for driving the magnetic tape at a fast speed, said fast movement instruction means including a nonprogram section detection slidable plate and a fast movement actuating means connected to said nonprogram section detection slidable plate for sliding said slidable plate in said one direction from a first position to a second position when actuated; and

switching means for placing said nonprogram section detection circuit in an operative condition only when both said playback instruction means and said fast movement instruction means are actuated, said switching means including a rotatable lever means responsive to actuation of said fast movement actuating means for rotating when said nonprogram section detection slidable plate is slid in said one direction by said fast movement actuating means, and switch means connected between a power source and said nonprogram section detection circuit means and responsive to actuation of said playback actuating means for engaging with said rotatable lever means when said slidable subchassis is slid a certain amount in said one direction by said playback actuating means, said nonprogram section detection circuit means being energized when said switch means engages with said rotatable lever means and providing a detection output when said nonprogram section is located.



4,323,936

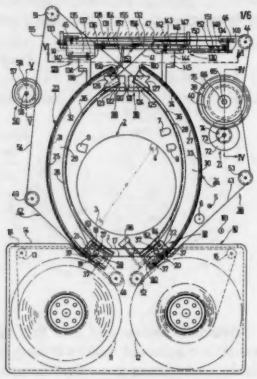
RECORDING AND/OR REPRODUCING APPARATUS

Franz Beitler, and Harald Neckamm, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 12, 1980, Ser. No. 148,644
Claims priority, application Austria, Jun. 28, 1979, 4550/79
Int. Cl.[3] G11B 15/66
U.S. Cl. 360—85 14 Claims

1. A recording and/or reproducing apparatus for a record carrier in the form of a tape which is accommodated in a cassette which comprises at least one opening for the withdrawal of a portion of the record carrier from said cassette and which cassette can be supported on the apparatus, which apparatus is provided with a tape guide drum around whose circumferential surface can be wrapped the portion of the record carrier which has been withdrawn from the cassette, and with a tape guide device which is adapted to withdraw a portion of the record carrier from the cassette and wrap said portion of the record carrier around the tape guide drum, which tape guide device comprises two substantially cylindrical tape guides which are each arranged on an associated one of two movable supports in the apparatus, which supports are movable between a rest position, in which the tape guides engage behind the record carrier contained in the cassette at the loca-

tion of the opening therein, and an operating position, in which the tape guides keep the portion of the record carrier which is moved by the tape guides when the supports are moved from their rest positions to their operating positions, wrapped around the tape guide drum, there being provided a wire drive arrangement for moving the two supports, which arrangement comprises a rotatable wire drum and two wires which each act on one of the two supports substantially in the direction of movement of the support from its rest position to its operating position and one of which passes to the rotatable wire drum via a wire guide, so as to be wound onto said wire drum, characterized in that the wire drive arrangement comprises two rotatable wire drums for winding in one wire each, the first wire which acts on a first one of the two supports substantially in



the direction of movement of said support from its rest position to its operating position passing to a first one of the two wire drums, in that the second wire which acts on the second one of the two supports substantially in the direction of movement of said support from its rest position to its operating position passes to the first support and acts on this support substantially in the direction of movement thereof from its operating position to its rest position, in that a third wire passes from the second of the two wire drums to the second support and acts on this support substantially in the direction of movement thereof from its operating position to its rest position, and in that for moving the two supports from their rest positions to their operating positions the first wire drum can be driven and for moving them from their operating positions to their rest positions the second wire drum can be driven.

4,323,937

TAPE RECORDERS OF THE CASSETTE TYPE

Giovanni Santoro, Via Campodimele 55, Roma, Italy

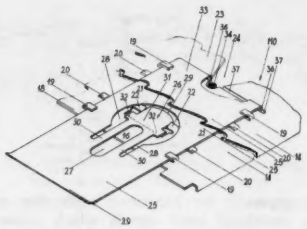
Filed Apr. 25, 1980, Ser. No. 143,534

Claims priority, application Italy, Apr. 30, 1979, 48897 A/79

Int. Cl.[3] **G11B** *15/24, 15/18*

U.S. Cl. 360—96.6 **6 Claims**

1. In a magnetic tape recorder of the cassette type comprising a mechanism provided with a suitable elastic means adapted to store energy during the first length of the cassette introduction stroke and then to release this energy both during the last length of said introduction stroke and during the necessary cassette ejection stroke, an improved mechanism for automatically controlling the introduction and "braked" ejection of the cassette, said improved mechanism comprising: a resilient guiding member adapted to perform an alternative sliding movement in parallel relationship with the introduction and ejection stroke on a supporting member placed above said cassette during said introduction and ejection stroke, wherein said supporting member has an elongated opening placed below said sliding guiding member and having a transversal straight edge and a stationary means protruding from the side edge thereof, and wherein said sliding guiding member comprises a rear pin adapted to cooperate with a cooperating member of said energy storing mechanism and a resilient member pre-bent in order to be normally bent in the path of said cassette for engaging the latter through said opening, said pre-bent member having matching protruding means adapted



to engage said stationary protruding means in said opening during the alternate movement of said sliding guiding member in order to cause, together with said transversal straight edge of said opening, said elastic member to move from its pre-bent lowered position where said resilient member engages said cassette to a forced raised position where said resilient member does not engage said cassette.

4,323,938

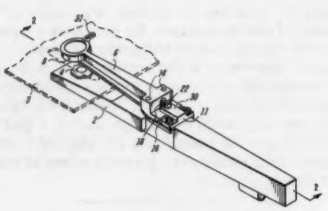
ROLLING PIVOT FOR MAGNETIC HEAD

Herbert E. Thompson, Los Gatos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 23, 1980, Ser. No. 152,975

Int. Cl.[3] **G11B** *5/54, 5/56, 21/12, 21/24*

U.S. Cl. 360—105 **5 Claims**



1. An apparatus for supporting a recording device comprising:

a support arm,

a carriage member,

a flexure spring,

means for securing a portion of said flexure spring to a first portion of an end section of said support arm and for securing another portion of said flexure spring to a portion of a section of said carriage member whereby said flexure spring couples said support arm to said carriage member,

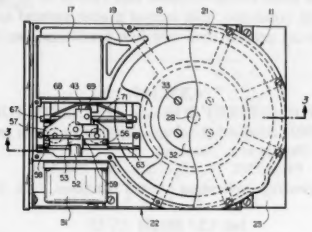
said flexure spring being located between said section of said support arm and said section of said carriage member,

a second portion of said end section of said support arm having a smoothly curved surface adjacent a portion of said flexure spring whereby a rolling pivot along said curved surface is provided for said support arm when said support arm is moved relative to said carriage member.

4,323,939
HARD FIXED DISC DRIVE ASSEMBLY AND READ-WRITE HEAD ACTUATOR

Syed H. Iftikar, Fremont, and David L. Reeck, San Jose, both of Calif., assignors to Shugart Technology, Scotts Valley, Calif.

Filed Apr. 11, 1980, Ser. No. 139,428
Int. Cl.³ G11B 5/55, 5/012, 21/08
U.S. Cl. 360—106 **3 Claims**

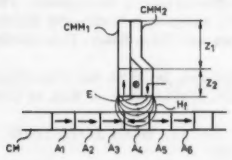


1. A disc drive including at least one disc,
means for mounting said disc;
means for driving said mounting means to rotate the disc;
at least one transducer cooperating with the surface of said disc to read and write information on the surface;
mounting means for mounting said transducer for cooperation with the disc;
a carriage for said transducer mounting means;
three spaced bearings having grooved outer surfaces mounted on said carriage;
a fixed cylindrical track adapted to receive two of said bearings to guide the carriage;
a spring-loaded cylindrical track adapted to engage the other bearing and urge said two bearings against the fixed tracks whereby the bearings are centered on said tracks for movement therealong; and
means for driving the carriage to move the carriage along said tracks so that the transducers are moved radially along the disc surface.

4,323,940
PROCESS, MAGNETIC TRANSDUCER AND SYSTEM FOR GENERATING A MAGNETIC INDUCTION FIELD WITHIN A MAGNETIC MEDIUM

Jean P. Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 18, 1979, Ser. No. 104,851
Claims priority, application France, Feb. 27, 1979, 79 05067
Int. Cl.³ G11B 5/12
U.S. Cl. 360—113 **14 Claims**

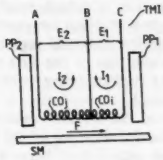


1. A process for generating a magnetic induction field within a magnetic medium having a magnetically unsaturated portion comprising producing within the unsaturated portion a magnetic energizing field, generating a selection wave and propagating said wave along at least one given path of said medium, starting from a given datum point and from a reference instant t_R, and reaching each point of the said path at an instant the selection wave and the energizing field acting simultaneously at the instant t_i on an area surrounding each point of the said path cause the magnetic properties of said area to be modified and the said induction field to be generated.

4,323,941
INTEGRATED MAGNETIC TRANSDUCER

Jean-Pierre Lazzari, Montfort L'amaury, and Jacques Desserre, Rambouillet, both of France, assignors to Compagnie International pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Jun. 9, 1980, Ser. No. 157,845
Claims priority, application France, Oct. 25, 1979, 79 26532
Int. Cl.³ G11B 5/20
U.S. Cl. 360—123 **6 Claims**

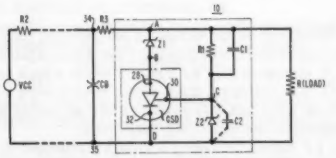


1. In a transducer for reading and/or writing data contained on a magnetic carrier passing before the latter, comprising two thin magnetic layers constituting the first and second pole pieces of the transducer, said layers being superimposed and magnetically coupled at one end and arranged at the other end adjacent the carrier, substantially perpendicular to the latter to form an air-gap to establish a magnetic circuit for the transducer, a coil disposed between the thin magnetic layers, said coil being of thin conductive layers superimposed in a direction perpendicular to the plane of the said magnetic layers and separated from each other by thin electrically insulating layers, said coil comprising at least two windings having a common electrical point, the improvement comprising means for creating equal magnetic fluxes in the downstream pole piece, said downstream pole piece being defined as that pole piece which is last to be passed by a carrier moving substantially perpendicular to the plane of the layers and the air gap and successively past the first and second pole pieces.

4,323,942
SOLID-STATE PROTECTOR CIRCUITRY USING GATED DIODE SWITCH

Adrian R. Hartman; Robert S. Scott, both of New Providence, and Peter W. Shackle, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 972,055, Dec. 20, 1978, Pat. No. 4,271,445. This application Feb. 11, 1980, Ser. No. 120,283
The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.
Int. Cl.³ H02H 3/20
U.S. Cl. 361—56 **7 Claims**



1. Circuitry comprising:
a first device having first and second terminals and having the

characteristic that there is substantially no conduction therethrough in one direction until a threshold voltage is reached and thereafter the voltage across the device stays essentially constant for increasing conduction therethrough;

a second device having first and second terminals and characteristics similar to the first device;

a switch having first output, second output, and control terminals;

a resistor having first and second terminals with the first terminal being coupled to the second terminal of the first device and the second terminal of the resistor being coupled to the control terminal of the switch and to the second terminal of the second device;

the first terminal of the first device is connected to the first output terminal of the switch;

the first terminal of the second device being coupled to the second output terminal of the switch;

the switch being a device of the type comprising a semiconductor body a bulk portion of which is of a relatively high resistivity, a first region of a first conductivity type and of a relatively low resistivity, a second region of a second conductivity type opposite that of the first conductivity type, the first and second regions being connected to first and second output terminals, respectively, of the switching device, a gate region of the second conductivity type being connected to the control terminal of the switching device, the first, second, and gate regions being mutually separated by portions of the semiconductor body bulk portion.

4,323,943

PROTECTION CIRCUITS

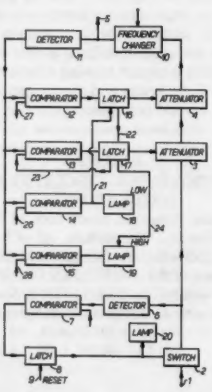
Victor F. Arnold, St. Albans, and Roger C. Dixon, Luton, both of England, assignors to Marconi Instruments Limited, Chelmsford, England

Filed Sep. 14, 1979, Ser. No. 78,597

Claims priority, application United Kingdom, Sep. 15, 1978, 37970/78

Int. Cl.³ H02H *3/00*

U.S. Cl. 361—114 **1 Claim**



1. An r.f. circuit for increasing the dynamic range of a measuring instrument while providing protection against overload, said r.f. circuit having an input terminal which in operation receives an applied r.f. input signal having wide variations in amplitude level and said circuit having an output terminal for connection to the measuring instrument;

said r.f. circuit including a switch connected to said input terminal and having an output;

switchable attenuator means connected between said output of the switch and said output terminal for selectively attenuating the r.f. input when the amplitude level thereof reaches a first predetermined amplitude level and including means for detecting the presence of said first predetermined amplitude level of the input signal;

latch means connected to said switch for latching the switch in open and closed conditions and including manual reset means for causing the switch to be latched in the closed condition; and

means connected to the output of said switch and to said latch means for detecting the presence of a second predetermined amplitude level of the r.f. input signal and actuating said latch means to cause said switch to be latched in the open condition, said second predetermined amplitude level being greater than said first predetermined level.

4,323,944

CONTROL CIRCUIT FOR AN ELECTROMAGNET

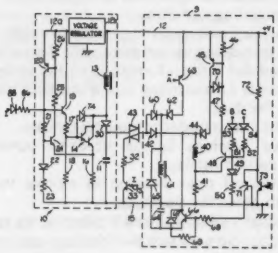
William F. Hill, Stafford, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 14, 1980, Ser. No. 196,430

Claims priority, application United Kingdom, Oct. 25, 1979, 36990/79

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—152 **11 Claims**



1. A control circuit for an electromagnet comprising a converter circuit including a main energy storage element, a secondary energy storage element, and circuit means connecting the main storage element to the electromagnet and to the secondary energy storage element and operating to cause energy to be transferred from main energy storage element to the electromagnet, and also effecting transfer of energy from the main energy storage element to the secondary storage element for subsequent use in applying a reverse voltage to the electromagnet when the period of energisation thereof is terminated.

4,323,945

POLARIZED ELECTROMAGNETIC RELAY

Hans Sauer, Fichtenstrasse 5, Deisenhofen, Fed. Rep. of Germany (D-8024), assignor to Matsushita Electric Works, Ltd., Kadoma, Japan and Hans Sauer, Deisenhofen, Fed. Rep. of Germany

Filed Jan. 24, 1980, Ser. No. 115,056

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902870

Int. Cl.³ H01H *51/22, 51/30*

U.S. Cl. 361—160 **12 Claims**

1. A relay including:

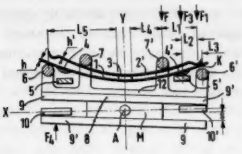
a stationary contact;

a first contact spring having a movable contact mounted thereon, said first contact spring being movable between a first position wherein said movable contact contacts said stationary contact, and a second position wherein said movable contact is spaced from said stationary contact;

a second contact spring disposed adjacent said first contact spring; said second contact spring containing a portion

touching said first contact spring when said first contact spring is in said first position;

armature means for moving said first contact spring between said first and second positions; said armature means including first actuator means for operatively engaging said second contact spring at a predetermined area and biasing said second contact spring against said first contact spring at said portion; and second actuator means for engaging said first contact spring at a predetermined area and moving said first contact spring to said second position; and wherein



$L_3/h < L_1/h'$;

L_1 is the length measured along said second contact spring between said area of operative engagement of said second contact spring with said first actuator means and said portion of said second contact spring;

L_3 is the length measured along said first contact spring between said area of engagement of said first contact spring with said second actuator means and said movable contact;

h is the thickness of said first contact spring; and

h' is the thickness of said second contact spring.

4,323,946

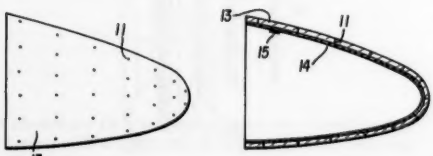
APPARATUS FOR REDUCING ELECTROSTATIC CHARGE STORAGE AND EMI ON DIELECTRIC SURFACES

Robert L. Traux, 604 Danley Dr., Fort Myers, Fla. 33907

Filed Sep. 20, 1979, Ser. No. 77,273

Int. Cl.³ H05F 3/00

U.S. Cl. 361—218 **20 Claims**



1. Apparatus for reducing residual electrostatic charge levels on an exposed dielectric surface of an aircraft body, the apparatus comprising:

a plurality of small diameter charge collection conductors projecting through the body and terminating at least adjacent to the dielectric surface for collecting around the charge collection conductors electrostatic charges accumulated on the surface;

conductive connecting means electrically connected to the charge collection conductors and disposed behind the dielectric surface for conducting the charges collected around the charge collection conductors away from the dielectric surface, and

a conductive air frame disposed adjacent to the dielectric surface and connected to the conductive connecting means for grounding the electrostatic charges conducted through to the conductive connecting means by the charge collecting conductors.

4,323,947

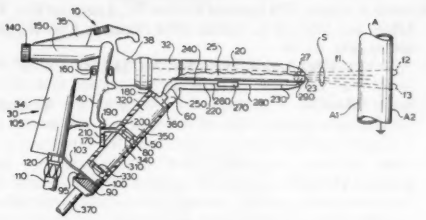
ELECTROSTATIC GUN WITH IMPROVED DIODE-CAPACITOR MULTIPLIER

Willi Huber, Altstätten, Switzerland, assignor to J. Wagner AG., Altstätten, Switzerland

Filed Aug. 13, 1979, Ser. No. 66,247

Int. Cl.³ B05B 5/02

U.S. Cl. 361—228 **3 Claims**



1. In a diode-capacitor multiplier circuit usable to generate a selected output voltage within a selected range for use in an electrostatic spray apparatus to apply a coating to an article, the multiplier having a selected number of stages and with each stage including a plurality of interconnected diodes and capacitors, an improvement comprising:

a first selected number of two or more capacitors each having a first selected value of capacitance;

a second selected number of two or more capacitors each having a second, different, value of capacitance; and

wherein a ratio of said first selected value of capacitance to said second selected value of capacitance corresponds substantially to a ratio of 1 to 2;

said first selected number of capacitors corresponds to a number within a range of 5% to 10% of the total number of capacitors in the multiplier and,

said second selected number of capacitors corresponds to the remainder of capacitors in the multiplier.

4,323,948

CAPACITOR STRUCTURES WITH IMPROVED ELECTRICAL STRESS CAPABILITY

George E. Mercier; John H. Pickett, both of Bloomington, and Barry L. Holtzman, Ellettsville, all of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 857,479, Dec. 5, 1977, abandoned. This application Apr. 24, 1980, Ser. No. 143,202

Int. Cl.³ H01G 4/22

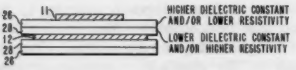
U.S. Cl. 361—315 **11 Claims**

1. A capacitor structure, particularly suitable for use in power capacitors having high electric stress capability, comprising:

a dielectric structure of sheet material including first and second layered portions, said sheet material being impregnated with a dielectric fluid;

a first electrode layer adjacent said first portion of said dielectric structure;

a second electrode layer adjacent said second portion of said dielectric structure, said second electrode layer having a greater width than said first electrode layer and being located to extend on said dielectric structure beyond opposite edges of said first electrode layer;



said first portion of said dielectric structure, as impregnated, having a higher dielectric constant or a lower electrical resistivity than said second portion;

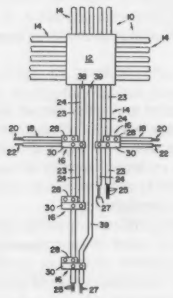
said first portion of said dielectric structure comprising a material selected from the group consisting essentially of polyester film, polyphenylene oxide film and cyanoethyl cellulose film.

4,323,949

SERVICE CABLE DISTRIBUTION SYSTEM

Kenneth E. Guritz, 570 Emerald Harbor Dr., Longboat Key, Fla. 33548, and Michael L. Guritz, 6904 Manatee Ave. W., Bradenton, Fla. 33508

Filed May 8, 1980, Ser. No. 147,742
Int. Cl.³ H02B *1/20*
U.S. Cl. 361—428 **11 Claims**



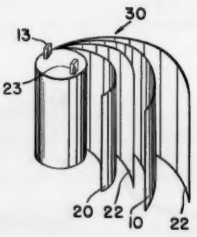
1. A service cable distribution system of the type used for placement and supply of power and low tension service cables over a floor surface area, said distribution system comprising: supply channel means comprising a first channel assembly disposed between a control area and a junction box assembly, said first channel assembly structured and dimensioned to house power cable and a second channel assembly disposed between the control area and said junction box assembly in spaced, segregated relation to the interior of said first channel assembly, said second channel assembly structured for housing of low tension cables independent of power cable, distribution channel means interconnected in direct communicating relation to said supply channel means via said junction box assembly, circuit breaker means and operatively disposed within said junction box assembly and disposed for electrical interconnection between power cables within said first channel assembly and power cables within said distribution channel means, said distribution channel means disposed and structured for housing power cables and low tension cables therein and for disposing the service cables in electrically interconnected relation with service cables within said supply channel means via said circuit breaker means, said junction box assembly comprises a plurality of junction box means disposed in aligned spaced apart relation to one another, each of said junction box means disposed in interconnected, communicating relation between said supply channel means and at least one of a plurality of distribution channels defining said distribution channel means, said first channel assembly comprises a power cable channel extending outwardly from the control area a distance sufficient to supply power over a predetermined service area, said power cable channel interconnected to each of said plurality of junction box means in substantially aligned, spaced apart relation to one another, each of said junction box means structured for direct communication with power cables within said first channel assembly and interconnected with one of a plurality of distribution channels, said second channel assembly comprises at least a first low tension cable channel extending outwardly from the control area and disposed in interconnected relation with a first predetermined number of said plurality of junction box means, said second channel assembly comprising at least a second low tension cable channel disposed to extend outwardly from the control area and into interconnected, communicating relation with a second predetermined number of said plurality of junction box means.

4,323,950

ELECTROLYTIC CAPACITOR WITH HIGH-PURITY ALUMINIZED CATHODE

Walter J. Bernard, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Oct. 31, 1979, Ser. No. 89,823
Int. Cl.³ H01G *9/00*; B01J *17/00*
U.S. Cl. 361—433 **4 Claims**

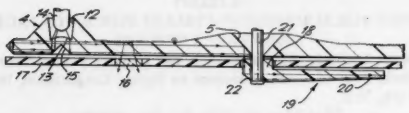


1. An electrolytic capacitor comprising a pair of convolutely wound electrodes with interleaved spacers in contact with an electrolyte, one of said electrodes being an anode and bearing a barrier dielectric oxide on the surface thereof, the other of said electrodes being a cathode of at least one sheet of a porous, non-calendered, high surface-area continuous substrate onto which aluminum has been deposited other than by spraying in a layer of about 2000 A to 5000 A thickness on each surface of said substrarte to provide a continuous high-purity cathode strip.

4,323,951
LAMINAR LIGHT GUIDE

Ian K. Pasco, Bracknell, England, assignor to Combined Optical Industries Ltd., Slough, England

Filed Jun. 16, 1980, Ser. No. 159,659
Claims priority, application United Kingdom, Nov. 27, 1979, 40914/79
Int. Cl.[3] G01D *11/28*
U.S. Cl. 362—27 9 Claims

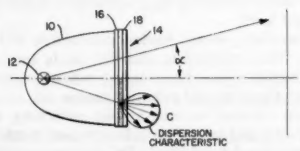


1. A light guide, comprising
(a) at least one generally planar transparent lamina (1, 2, 3) including at least one integral light input socket (4) having an axis arranged generally normal to the plane of said lamina;
(b) a light source (14) arranged within said socket; and
(c) means for directing light from said light source into said planar lamina, including
(1) first integral lens means (13) arranged adjacent said socket for focusing parallel beams of light into said lamina in a direction parallel to said socket axis; and
(2) deflecting means (15) arranged in said lamina opposite said lens means for radially deflecting said parallel beams of light from said lens means in a direction normal to said socket axis, whereby light is distributed throughout said lamina.

4,323,952
REFLECTOR FOR VARYING ILLUMINATION DISTRIBUTION

Joachim Proske, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke GmbH & Co., Brunswick, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 154,968
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2924956
Int. Cl.[3] G03B *15/02*
U.S. Cl. 362—17 3 Claims

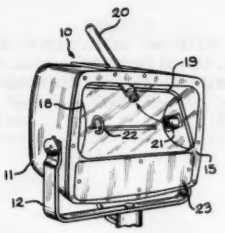


1. A camera and flash unit combination, said camera having a lens system with a variable focal length, and said flash unit comprising
a light source and a reflector mounted to effectively provide a front surface of said flash unit at which a selective portion of said light from said source is scattered, and
means for selectively controlling the relative angular distribution of the light that is transmitted through said front surface, by generating a control voltage and applying said control voltage to said at least one liquid-crystal cell to control the amount of said scattering, including at least one nematic liquid-crystal cell located in said transmitting surface of said flash unit and means for adjusting the magnitude of said control voltage in accordance with the focal length of said lens system to provide the corresponding relative angular distribution.

4,323,953
FLOODLIGHT

Mark A. Hutchison, Crawfordsville, Ind., assignor to National Service Industries, Inc., Crawfordsville, Ind.

Filed May 19, 1980, Ser. No. 151,262
Int. Cl.[3] H01R *33/00*
U.S. Cl. 362—226 5 Claims

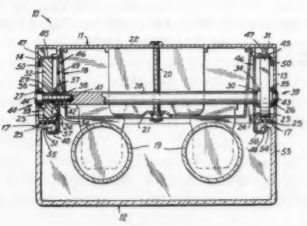


1. A lighting fixture comprising an enclosed housing including a side, said housing side defining an opening, a light transmitting lense enclosing said side opening, a reflector, hinge means connecting said reflector to said housing adjacent said lense to pivot said reflector relative to said housing between a normal operating position and a relamping position, latch means spaced from said hinge means for releasably holding said reflector in said normal position, a lamp socket mounted on said reflector for supporting a lamp between said reflector and said lense, and means in said housing for providing access to said latch means for releasing and pivoting said reflector and said lamp socket to said relamping position and for providing access to a lamp supported in said socket when said reflector is pivoted to said relamping position.

4,323,954
MOISTURE SEALED VANDAL-RESISTANT LIGHTING FIXTURE

Noel S. Florence, Cranford, and Norman Lynn, Hillsdale, both of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.

Filed Jun. 30, 1980, Ser. No. 164,775
Int. Cl.[3] F21V *29/00*
U.S. Cl. 362—267 12 Claims



1. A lighting fixture including a housing having a top wall and depending side walls defining a downwardly open mouth, a horizontally disposed short flange member formed on the inner surface of each side wall, said short flange members being disposed in coplanar alignment, an actuator channel vertically moveably mounted adjacent each said side wall, said actuator channels each including an upper flange overlying a said short flange and a lower flange underlying said short flange, a dif-

fuser member having an upwardly directed rim sized to seal said mouth portion, said diffuser member including horizontally disposed lip portions mounted on said lower flanges of said actuator channels, a spaced pair of cam means interposed between and reacting against said upper flanges for shifting said channels between a locked position whereat said rim is engaged against said mouth portion and a release position whereat said rim is spaced below said mouth portion, and cam actuator means accessible through a said sidewall and operatively connected to said cam means for shifting the same between said locked and release positions.

4,323,955

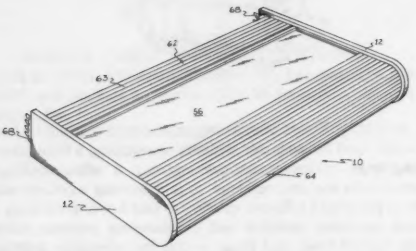
LIGHT WITH 360° ROTATABLE COVER

Edward H. Mark, U.S. 31 North, Niles, Mich. 49120

Filed Jul. 21, 1980, Ser. No. 170,857

Int. Cl.³ F21V *1/10*

U.S. Cl. 362—278 **3 Claims**



1. A lighting facility comprising a pair of spaced end plates having opposing side faces, a subassembly extending between said end plates from one side face to the other side face thereof, said subassembly including a light source, each end plate having a peripheral groove formed in its said side face circumscribing said subassembly at the end plate, a flexible cover extending between said end plates and including edges each fitted within a said groove, each groove constituting guide means wherein said cover can be rotated about said light source to various operative positions, said cover constituting means to control the direction of light from said light source when rotated about the source.

4,323,956

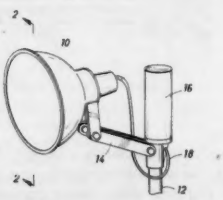
LENS CLOSURE FOR LIGHT FIXTURE AND METHOD FOR ATTACHMENT

Marvin J. Pustka, New Braunfels, Tex., assignor to Esquire, Inc., New York, N.Y.

Division of Ser. No. 953,271, Oct. 20, 1978, Pat. No. 4,240,853. This application Mar. 17, 1980, Ser. No. 130,841

Int. Cl.³ F21V *17/00*

U.S. Cl. 362—374 **5 Claims**



1. A lighting fixture combination comprising

a housing for enclosing a light source therein, such that the light source is sufficiently recessed so that the plane of the opening through which light emanates does not intersect the light source, said housing means not having front entry means to access the light source; said housing including a radially outward projecting front flange;

an adhesive means applied to the outside perimeter of the radially outward projecting flange;

a plastic window lens for the housing united to the housing by the above mentioned adhesive means; and

a cored metal trim covering the plastic lens and adhesive means against the flange.

4,323,957

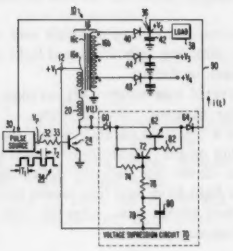
VOLTAGE SUPRESSION CIRCUIT FOR A VOLTAGE CONVERTER CIRCUIT

Charles A. Clark, Jr., Chatsworth, and Finis C. Easter, Canoga Park, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed May 16, 1980, Ser. No. 150,284

Int. Cl.³ H02M *3/335;* H02H *7/122*

U.S. Cl. 363—21 **9 Claims**



1. In a voltage conversion circuit which includes a transformer with a primary winding receptive of input DC voltage and a secondary winding and which includes a first switching means coupled in series with the primary winding for alternately applying and removing the input DC voltage to and from the primary winding, and wherein the removing of the input DC voltage from the primary winding normally produces an undesirable transient signal through the first switching means, the improvement which comprises:

first diode coupled to said first switching means and poled to conduct said transient signal, in the forward bias mode, away from said first switching means,

potential means for clamping said transient signal to a predetermined level,

second switching means having conductive and non-conductive states coupled to said first diode and coupled to said potential means for coupling, when conductive, said transient signal to said potential means, and

bias means coupled to said second switching means for maintaining said second switching means in said non-conductive state when said input DC voltage is applied to said primary winding and for maintaining said second switching means in said conductive state after said input DC voltage is removed from said primary winding.

4,323,958

CIRCUIT FOR CONTROLLING THE SWITCHING FREQUENCY OF SCR REGULATORS

John R. Nowell, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Sep. 26, 1980, Ser. No. 191,112

Int. Cl.³ H02P *13/22*

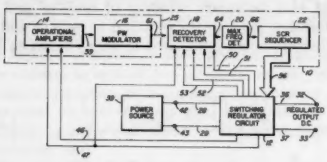
U.S. Cl. 363—28 **12 Claims**

1. A method of controlling a switching regulator circuit having a plurality of SCRs and reactors comprising the steps of:

a. producing a continuous digital pulse stream,

b. varying the frequency of said digital pulse stream within the approximate range of 0–400 KHz in response to deviation of the output voltage of said switching regulator circuit from a predetermined voltage;

c. preventing said digital pulse stream from exceeding a certain maximum frequency; and



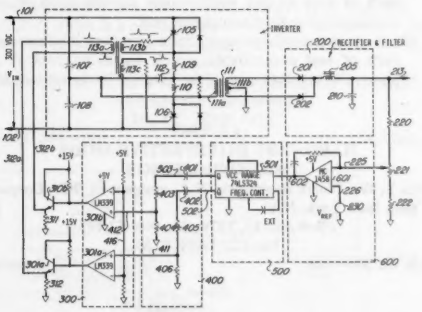
d. distributing one pulse of said digital pulse stream to each SCR of said plurality of SCRs in a preselected sequence for firing said SCR to maintain the output voltage of said switching regulator circuit approximately equal to said predetermined voltage.

4,323,959

POWER SUPPLY WITH RESONANT INVERTER CIRCUIT USING VARIABLE FREQUENCY CONTROL FOR REGULATION

Kenneth A. Check, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 904,368, May 10, 1978, abandoned.
This application Sep. 2, 1980, Ser. No. 183,532
Int. Cl.³ H02M *3/315*
U.S. Cl. 363—40 **1 Claim**



1. A switching power supply circuit comprising:

input means for receiving a first alternating current (AC) signal;

first rectifying and filtering means coupled to said input means for providing a first direct current (DC) signal in response to said first AC signal;

inverter means generating minimal radio frequency interference (RFI) coupled to said first rectifying and filtering means for providing a second AC signal having a substantially sinusoidal waveform in response to the first DC signal and to an inverter control signal, said inverter consisting of a pair of SCR's alternately triggered and negatively biased;

inverter control means coupled to said inverter means for providing said inverter control signal and for varying the frequency of said inverter control signal in response to an indication of a desired power output from said inverter, said inverter control means further comprising:

a first comparator means for providing a first comparison signal in response to a comparison of a DC output signal with a preselected reference signal;

an oscillator coupled to said first comparator means for providing an oscillator output signal in response to said first comparison signal;

a differentiator means coupled to said oscillator for simultaneously providing a negative differentiated pulse to one and a positive differentiated pulse to the other of said pair of SCR's via a transformer in response to said oscillator output signal; and

means for providing said inverter control signal in response to said oscillator output signal; and

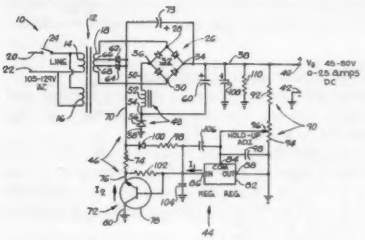
second means coupled to said inverter means for providing said DC output signal in response to said second AC signal.

4,323,960

DUAL MODE DIRECT CURRENT POWER SUPPLY

Lee J. Jones, Gatlinburg, Tenn., assignor to Ten-Tec, Inc., Sevierville, Tenn.

Filed Jul. 31, 1980, Ser. No. 174,004
Int. Cl.³ H02P *13/26*
U.S. Cl. 363—48 **13 Claims**



1. A dual mode power supply, comprising

power input means for providing alternating current power;

a pair of direct current output conductors;

and first and second rectifier-filter means connected between said power input means and said direct current output conductors;

said first and second rectifier-filter means being connected in parallel across said direct current output conductors;

said first rectifier-filter means comprising first rectifier means for producing first rectified voltage pulses,

a first filter capacitor connected across the output of said first rectifier means and adapted to be charged by said first rectified voltage pulses,

and electronic voltage regulator means including series transistor means connected between said first filter capacitor and said direct current output conductors;

said second rectifier-filter means including second rectifier means for producing second rectified voltage pulses,

a choke input filter connected to the output of said second rectifier means and including a filter inductance and a second filter capacitor adapted to be charged through said filter inductance to the average value of said second rectified voltage pulses;

said voltage regulator means causing said series transistor means to be substantially nonconductive for normal alternating current input voltage and low output load conditions;

said second rectifier-filter means being effective to supply output voltage and current under conditions of normal alternating current input voltage and low output load;

said first rectifier-filter means producing a higher output voltage than said second rectifier-filter means;

said voltage regulator means causing said transistor means to be conductive increasingly in response to decreasing output voltage across said output conductors due to increasing load or decreasing alternating current input voltage

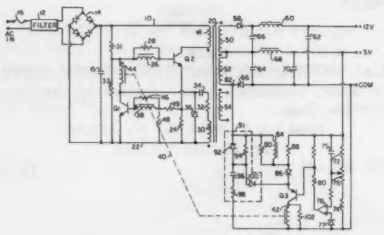
whereby an increasing share of the direct current output power is supplied by said first rectifier-filter means.

4,323,961

FREE-RUNNING FLYBACK DC POWER SUPPLY

Elliot Josephson, Los Altos, Calif., assignor to Astec Components, Ltd., Santa Clara, Calif.

Filed Sep. 12, 1980, Ser. No. 186,454
Int. Cl.³ H02H 7/122
U.S. Cl. 363—56 **18 Claims**



1. A DC power supply comprising:

a power transformer having a primary winding and a secondary winding, one end of said primary winding being coupled to a source of DC;

electrical switching means coupled to the other end of said primary winding, said switching means when closed causing power to be stored in said power transformer, and when open enabling said power to be output through said secondary winding;

rectifier means attached to said secondary winding for generating an output DC voltage from said secondary winding output power;

pulse generator means for generating a pulse at a point in time after said switching means closes as a function of the present value of said output voltage;

means for coupling said pulse to said electrical switching means, said pulse causing said electrical switching means to switch off;

means for switching off said electrical switching means when said source of DC drops below a predetermined minimum;

means for switching off said electrical switching means when the current through said switching means exceeds a predetermined maximum; and

means for switching on said electrical switching means at a point in time after the switching off of said switching means.

4,323,962

HIGH EFFICIENCY RECTIFIER WITH MULTIPLE OUTPUTS

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,927
Int. Cl.³ H02M 7/217
U.S. Cl. 363—127 **2 Claims**

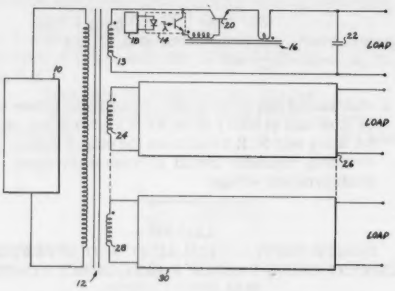
1. A high efficiency half-wave rectifier supplying at least one external load comprising:

a first transformer having a secondary winding for each load, and a primary winding adapted to be connected to an external alternating power source, one side of each of said secondary windings being connected to one side of the corresponding load;

a second transformer for each load to be supplied having a primary and a secondary winding;

controllable switch means connected between the other side of said secondary winding of each of said first transformers and one side of said secondary winding of each of said second transformers;

a transistor for each load to be supplied having a base, a collector and an emitter, the collector and emitter being connected in series between the other side of said secondary windings of each of said first transformers and each of said external loads, the base being connected to the other side of said secondary winding of each of said second transformers, the primary windings of each of said second transformers being connected in series between the sec-



ondary winding of each of said first transformers and each of said loads so that when load current is passing through said primary windings of each of said second transformers when each of said switch means is closed, current is caused to flow by transformer action in the secondary of each of said second transformers driving each of said transistors into hard saturation; and

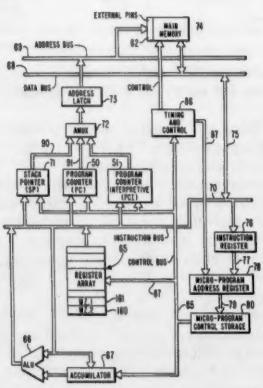
phase control regulator means for controlling the turn-on of each of said controllable switch means to control the power delivered to each of the external loads individually.

4,323,963

HARDWARE INTERPRETIVE MODE MICROPROCESSOR

Chin T. Wu, North Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 13, 1979, Ser. No. 57,497
Int. Cl.³ G06F 9/30
U.S. Cl. 364—200 **2 Claims**



1. In a data processor comprising memory means containing subroutines each having low level instructions with the last instruction being an INTERPRET instruction, and high level

language instructions which point to memory locations in said memory means containing the starting addresses of said subroutines said data processor having, a hardware high level language interpret capability and further comprising:

first and second program counter means which point respectively to said high level language instructions and to said subroutine instructions;

control and timing means responsive to said INTERPRET instruction to load said second program counter means with the subroutine starting address contained in the memory location accessed by the high level language instruction pointed to by said first program counter means;

said second program counter means responsive to signals generated by said control and timing means to act as program counter and point to the instructions in said subroutine; and

in which predetermined ones of said subroutines contain a BRANCH ON CONDITION ON PCI instruction which tests a condition and in which said control and timing means is responsive to said BRANCH ON CONDITION ON PCI instruction, when said tested condition is true and followed by said INTERPRET instruction, to load said first program counter means with the address contained in the next high level instruction pointed to by said first program counter means, and is further responsive to said BRANCH ON CONDITION ON PCI when said tested condition is false to increment said first program counter means to skip said next high level language instruction.

4,323,964

CPU EMPLOYING MICRO PROGRAMMABLE CONTROL FOR USE IN A DATA PROCESSING SYSTEM

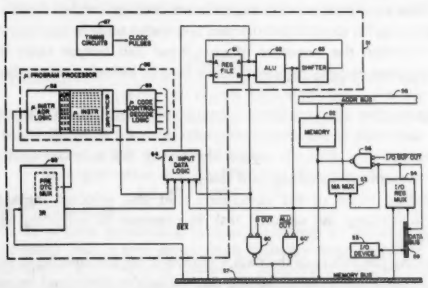
Ronald H. Gruner, Framingham, Mass., assignor to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 737,624, Nov. 1, 1976, Pat. No. 4,205,372, which is a continuation of Ser. No. 509,186, Sep. 25, 1974, Pat. No. 3,990,052. This application Oct. 9, 1979, Ser. No. 83,048

The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.

Int. Cl.³ G06F *9/22*

U.S. Cl. 364—200 **8 Claims**



1. A data processing system, comprising:

processor means for processing data,

memory means for storing at least one sequence of instructions to be performed by said data processing means,

microprogram means for providing sequences of micro-instructions to said processor means for performing said instructions, said instructions including at least one no-op instruction to be performed by at least one of said sequence of micro-instructions selected from an extended set of micro-instructions, and

memory bus means connected from an output of said memory means and to an input of said micro-program means for conducting memory output signals representing said instructions to said microprogram means,

said processor means including

a quadriport register file having dual read ports and dual write ports,

an arithmetic-logic unit for performing arithmetic and logical operations on input information supplied thereto and having a pair of inputs and output,

a shifter unit for providing a shifted output therefrom to said register file and having an input and an output connected to an input of said register file,

means for connecting said dual read ports of said register file to said inputs of said arithmetic-logic unit

means for connecting at least one of said read ports of said register file to at least one of said write ports of said register file,

memory address register means for providing addresses to said memory means, and

means for connecting said output of said arithmetic-logic unit to an input of said memory address register means, to an input of said shifter unit, and to at least one of said write ports of said register file, and

said microprogram means including

micro-instruction control store means having first and second memory spaces for respectively storing and providing to said processor means a non-extended set of said micro-instructions and said extended set of micro-instructions, and

instruction decoding means having an input connected from said memory bus means and an output connected to an addressing input of said micro-instruction control store means and responsive to said instructions for decoding said instructions and providing address signals to said micro-instruction control store means for selecting each of said micro-instructions, including means responsive to first certain portions of said instructions for selecting said at least one sequence of micro-instructions from said extended set of micro-instructions when a present instruction is a said at least one no-op instruction, each one of said first certain portions of said instructions containing information for identifying whether each one of said instruction is said a said at least one no-op instruction,

whereby said micro-instruction control store means is responsive to said address signals provided by said instruction decoding means as a result of said decoding by said instruction decoding means of said first certain portions of said instructions to provide said at least one sequence of micro-instructions from said extended set of micro-instructions stored in said second memory space to said processor means when a said instruction present on said memory bus means is a said at least one no-op instruction.

4,323,965

SEQUENTIAL CHIP SELECT DECODE APPARATUS AND METHOD

Robert B. Johnson, Billerica; Chester M. Nibby, Jr., Peabody, and Dana Moore, Dover, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 8, 1980, Ser. No. 110,523

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **38 Claims**

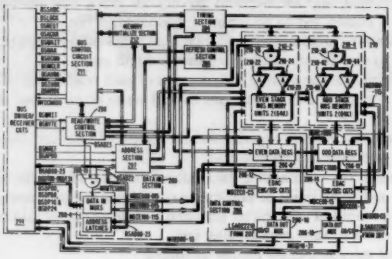
1. A memory subsystem for use in a system including a processing unit coupled to a multiword bus in common with said subsystem, said processing unit being operative to generate memory requests on said bus to said subsystem, each of said requests including a multibit address, said memory subsystem comprising:

a plurality of independently addressable memory module units, each memory unit being individually coupled to said multiword bus, said each memory unit including a plurality of rows of random access memory chips;

decode logic circuit means having a number of outputs, said decode logic circuit means generating decode outputs signals at said number of outputs in response to at least

significant portion of each said multibit address of each request received from said bus; and

gating means having a plurality of inputs and outputs, said outputs being selectively coupled to said plurality of rows of chips of said addressable memory module units and said gating means inputs being selectively connected to said



decoder means outputs so as to simultaneously generate at a plurality of sequential row address select signals at a plurality of said outputs in response to each said least significant address portion enabling simultaneous access to a plurality of word locations of said memory module units specified by another more significant portion of each said multibit address during a single bus cycle of operation.

4,323,966

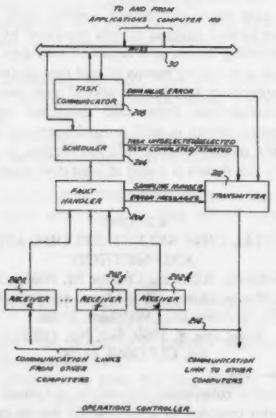
OPERATIONS CONTROLLER FOR A FAULT-TOLERANT MULTIPLE COMPUTER SYSTEM

Arliss E. Whiteside, Royal Oak; Morris D. Freedman, Southfield, both of Mich.; Omur Tasar, Harvard, Mass., and Alexander M. Rothschild, Ann Arbor, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 5, 1980, Ser. No. 118,693

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **35 Claims**



31. A method for controlling a plurality of computers to execute, in a coordinated fault tolerant manner, a predetermined set of tasks in response to inputs from external sources to produce an output to at least one external device, and wherein each computer includes an application computer capable of executing a subset of the predetermined set of tasks, and wherein the subset of tasks for each computer is different and includes at least one input/output task for receiving data variables from said external sources and outputing data variables to said at least one external device, and wherein said plurality of computers sends messages to every other computer including task selected messages identifying the tasks it has selected, task data value messages containing the values of the data variables resulting from the executed tasks, and error messages containing the identification of the computers which sent messages having detected errors, said method comprising the steps of:

checking all the messages received from said plurality of computers to detect any errors in said messages and to generate error signals identifying each computer which sent a message having a detected error;

counting the number of computers which sent said error messages identifying each computer which sent a message having a detected error;

comparing said number with a predetermined number to generate said error signal identifying each computer which sent a message having an error detected by a number of computers greater than said predetermined number;

recording as faulty, the identify of each computer identified in said error signals to generate a fault status table storing the identify of each computer which sent a message containing an error;

discarding all messages received from computers recorded as faulty in said fault status table;

storing by each computer its own subset of tasks in a task status table, said task status table listing each task of said subset in its order of execution priority;

recording in said task status table the receipt of each data variable required for the execution of each task in response to said task data value messages;

setting a task ready indicator signifying the task is ready for execution in response to the recording in said task status table all data variables required for the execution of that task;

setting in said task status table task selected indicators signifying the task has been selected by another computer in response to said task selected message received from other computers said task selected indicators further identifying the computer that selected the task;

selecting for execution from said task status table said at least one input/output task at predetermined intervals;

selecting for execution from said task status table in the interval between the selection of said input and output tasks the highest priority unselected task having its task ready indicator set;

setting the task selected indicator associated with its own computer in response to the selection of a task;

generating a dispatch signal identifying the selected task in response to selecting said task;

sending to all of the computers said task selected message identifying the selected task in response to selecting said task;

storing the values of the data variables input in response to said input/output tasks and the data variables contained in said data value messages to generate a data values table;

assembling the values of the data variables stored in the data values table for the selected task in response to said dispatch signal to generate a task input table;

forwarding to the applications computer the values of the data variables stored in said task input table when the applications computer signifies it has completed a preceeding task;

storing the values of the data variables generated by the applications computer in the execution of the selected task;

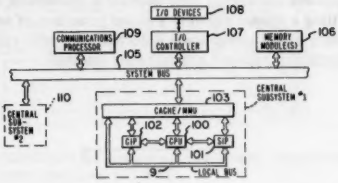
sending to all of the computers the values of the data variables stored in the task output table in response to the applications computer signifying it has completed the execution of the task; and

repetitively executing all of the above steps.

4,323,967
LOCAL BUS INTERFACE FOR CONTROLLING INFORMATION TRANSFERS BETWEEN UNITS IN A CENTRAL SUBSYSTEM

Arthur Peters, Sudbury; Virendra S. Negi, Pepperell; David E. Cushing, Chelmsford; Richard P. Brown, Acton, all of Mass., and Thomas F. Joyce, Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 15, 1980, Ser. No. 140,622
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **8 Claims**



1. A data processing system including a main system having a plurality of main data processing units coupled by a system bus, the main data processing units including system memory modules and main system means for initiating information transfers, and a central subsystem comprising:

a plurality of subsystem processing means for independently initiating information transfers directed to said main processing units and to others of said subsystem processing means;

subsystem bus means coupled to each of said plurality of subsystem processing means for asynchronously permitting information transfers during subsystem bus cycles comprising predetermined time periods for using said subsystem bus to transmit said information transfers;

and bus control means coupled to said system bus and said subsystem bus means for selectively allocating said subsystem bus cycles to any of said main system means or any of said subsystem processing means to initiate said information transfers, said subsystem bus means further asynchronously permitting information transfers between said subsystem bus means and said system bus during said allocated bus cycles.

4,323,968
MULTILEVEL STORAGE SYSTEM HAVING UNITARY CONTROL OF DATA TRANSFERS

Anthony J. Capozzi, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 955,031, Oct. 26, 1978, abandoned.
This application Jul. 15, 1980, Ser. No. 169,008
Int. Cl.³ G06F *13/06*
U.S. Cl. 364—200 **1 Claim**

1. In a data processing system including an information processing unit; a low speed, high capacity main memory; a high speed, low capacity cache for temporarily storing data being used by said information processing unit; at least one input/output channel for transferring information into or out of said information processing unit from devices other than said main memory or said cache; a data transfer and control means comprising:

a storage address register connected to said information processing unit for storing the address of data requested by said information processing unit;

a directory connected to said storage address register for storing addresses of data stored in said cache;

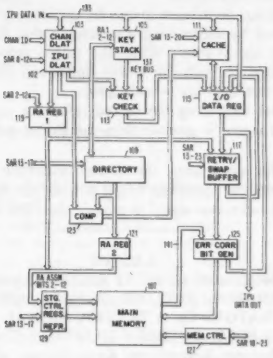
an error correction/bit generator connected to the output of said main memory for detecting memory errors and for generating correction bits;

an input/output data register connected to said information processing unit, said cache and said error correction/bit generator by a plurality of bidirectional data busses for transferring information into or out of said information processing unit from or to said main memory or said cache,

means including said directory and said storage address register for interrogating a data request from said information processing unit to determine if it is a hit indicating that said data is in said cache or a miss indicating that said data is not in said cache;

transfer means connected to said main memory, said cache, said error correction/bit generator and said interrogating means, and operative in response to a miss indication from said interrogating means to initiate the transfer of the requested data from said main memory to said cache; and

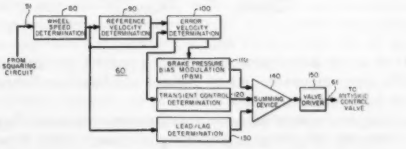
a unitary control connected to said information processing unit, said main memory, said cache and said error correction/bit generator operative to control all data transfers between said information processing unit, said cache and said main memory; said unitary control including said interrogating means, said transfer means, and a means connected to said main memory and said storage address register for maintaining the synchronization of each step in the transfer of data between said main memory and said error correction/bit generator, between said error correction/bit generator and said input/output data register, between said input/output data register and said cache, and between said information processing unit and said input/output data register, whereby said data transfers can take place simultaneously and in step-by-step synchronization.



4,323,969
APPARATUS FOR GENERATING A REFERENCE SIGNAL IN A BRAKE CONTROL SYSTEM

Thomas Skarvada, Woodland Hills, Calif., assignor to Crane Co., Chicago, Ill.

Filed Jul. 25, 1979, Ser. No. 60,573
Int. Cl.³ G06F *15/20*; B60T *8/08*
U.S. Cl. 364—426 **16 Claims**



1. An apparatus for generating a reference signal representative of a reference braking condition in a brake control system, said brake control system including means for generating a

wheel signal representative of a braking condition of a braked wheel, said apparatus comprising:

means for storing a reference signal representative of a reference braking condition;

means for storing a rate signal;

rate signal adjustment means for causing the stored rate signal to seek a value indicative of braking conditions by seeking a dynamic balance between increments and decrements to the stored rate signal, said rate signal adjustment means comprising:

rate signal increment means for increasing the stored rate signal by adding selected value to the stored rate signal solely when the stored reference signal is compared with the wheel signal and found to be greater than the wheel signal; and

rate signal decrement means for decreasing the stored rate signal by subtracting a selected value from the stored rate signal solely when the stored reference signal is compared with the wheel signal and found not to be greater than the wheel signal;

means for increasing the stored reference signal when the wheel signal is greater than the stored reference signal; and

means for decreasing the stored reference signal by an amount corresponding to the stored rate signal when the stored reference signal is greater than the wheel signal.

4,323,970

METHOD AND CIRCUIT ARRANGEMENT FOR GENERATING SETTING SIGNALS FOR SIGNAL GENERATORS OF A TRAFFIC SIGNAL SYSTEM, PARTICULARLY A STREET TRAFFIC SIGNAL SYSTEM

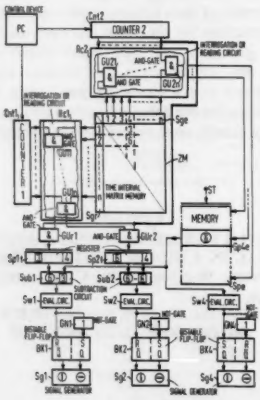
Heinrich Brunner, Rottach, and Karin Fischer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,291

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1979, 2925333; Sep. 24, 1979, 2938528

Int. Cl.³ G08G *1/07*

U.S. Cl. 364—436 **9 Claims**



1. A method for generating setting signals for operating traffic signal generators which control mutually hostile traffic flows, comprising the steps of:

storing in a matrix memory time intervals corresponding to entry signal groups representing release of traffic flow by respective traffic signal generators and associated to hostile clearing signal groups representing stoppage of traffic flow by respective traffic signal generators;

reading the time intervals corresponding to a distinct entry signal group and associated to clearing signal groups hostile to said entry signal group from the matrix memory;

storing the greatest time interval of said time intervals read from the matrix memory in a separate storage element and cyclically reducing said stored time interval to zero;

subtracting each of said time intervals read from the matrix memory from said stored greatest time interval being cyclically reduced;

detecting a zero difference of the subtraction results and emitting a respective block signal for a signal generator of the appertaining clearing signal group to which the respective subtracted time interval is associated; and

emitting a release signal to a signal generator of said distinct entry signal group upon detection of a zero value of said cyclically reduced greatest time interval.

4,323,971

ADJUSTMENT MEANS FOR STRETCH REDUCTION ROLLING MILLS

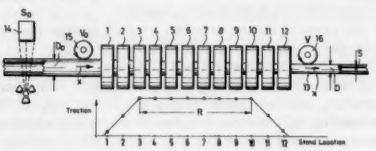
Hermann Möltner, Düsseldorf, and Wolfgang Siebenborn, Dormagen, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Düsseldorf, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,411

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1979, 2947233

Int. Cl.³ G06F *15/46*; B21B *37/00*

U.S. Cl. 364—469 **8 Claims**

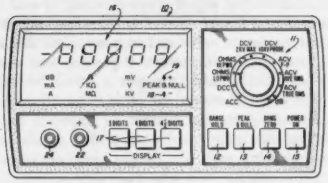


1. Adjustment device for regulating the total degree of drawing of a multi-stand stretch-reduction rolling mill for the stretch-reduction of tube, by means of which the degree of drawing is adjustable as a function of the entrance measurements of the mean wall thickness of the tube in order to obtain a desired, uniform finished tube wall thickness, comprising means for measuring the wall thickness of a tube entering the stretch-reducing rolling mill and providing a signal relate to said wall thickness, means for measuring the speed of said tube entering the stretch-reducing rolling mill and providing a signal relate to said speed, means for measuring the speed of said tube leaving the stretch-reducing rolling mill and providing a signal related to said speed, a digital unit receiving said signals from the means for measuring wall thickness and the means for measuring entering speed and the means for measuring exit speed, a value for original diameter entering said stretching reducing mill and a value for desired final diameter, said digital unit calculating intermittently one of a desired and theoretical elongation ($\lambda_{theor.}$) from said wall thicknesses and external diameters of both the actually entering and desired finished tube sections and continuously calculating the actual elongations or stretchings ($\lambda_{act.}$) from the entrance and exit speeds (V_o,V) of the tube and regulator means adjusting the roll speeds r.p.m. (n) as a function of the differences in theoretical and actual elongation or stretchings ($\Delta\lambda$) present in a control loop, said regulator means receiving a control signal from said digital unit.

4,323,972
OHM METER WITH AUTOMATIC LEAD RESISTANCE COMPENSATION

Robert A. Winter, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.

Filed Mar. 10, 1980, Ser. No. 128,914
Int. Cl.[3] G01R 27/00
U.S. Cl. 364—482 5 Claims

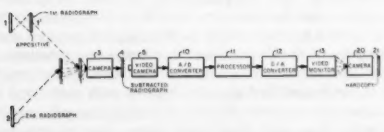


1. An instrument for measuring resistance, comprising
a first input and a second input,
metering means connected to said inputs for providing an electric output signal representative of the resistance between said inputs,
microprocessor means to which said output signal is connected,
switch means connected to said microprocessor means,
said microprocessor means including data memory for storing a signal representative of the resistance value connected between said first and second inputs while said switch means is in a first switching mode,
display means for displaying a numerical value represented by an electric input signal applied thereto, and
said microprocessor means supplying to said display means said electric input signal when said switch means is in a second switch mode, said electric input signal representing the resistance value between said first and second inputs while said switch means is in said second switching mode minus the resistance value between said first and second inputs when said switch means was last in said f switch mode, said electric input signal representing the resistance value between said first and second inputs while said switch means is in said second switching mode minus the resistance value between said first and second inputs when said switch means was last in said first switch mode.

4,323,973
APPARATUS AND METHOD FOR ENHANCING RADIOGRAPHS

George B. Greenfield, 4855 Greenleaf Ave., Lincolnwood, Ill. 60646

Filed Dec. 20, 1979, Ser. No. 105,773
Int. Cl.[3] H04N 5/14; G06F 15/42
U.S. Cl. 364—515 39 Claims

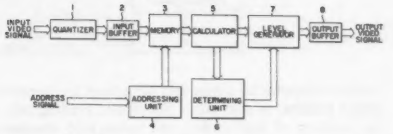


1. A method for enhancing radiographs comprising the following steps:
producing a first radiograph of an anatomical area;
producing a second radiograph of said anatomical area subsequent to introducing a radiographic contrast medium into preselected portions of said anatomical area;
forming a digitized, subtracted image from said first and second radiograph;
modifying said digitized, subtracted image by testing the light intensity of a plurality of portions of said subtracted image against a threshold and selectively increasing or decreasing said light intensity of said portions according to the result of said testing to obtain an image of increased contrast; and
displaying said modified image.

4,323,974
METHOD OF RESTORING A PICTURE THROUGH ESTIMATION

Keiji Sekigawa, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1980, Ser. No. 127,471
Claims priority, application Japan, Mar. 7, 1979, 54-26502
Int. Cl.[3] G06F 15/20; H04N 5/14
U.S. Cl. 364—515 2 Claims



1. A method of restoring a picture through estimation, comprising the steps of:
reading an original picture into a plurality of first picture elements by sampling said original picture in relatively low picture element concentration, said first picture elements being divided into first picture element regions each of which has an arrangement of n×n first picture elements;
converting each first picture element region into a second picture element region which has an arrangement of 1.5 n×1.5 n second picture elements each of which is smaller in area than each first picture element;
subjecting the density levels of the first picture elements in each first picture element region to decimal quantization to provide the average value of the density levels thus decimal-quantized;
obtaining the density level data of predetermined second picture elements in each second picture element region by using predetermined equations corresponding to the distribution of the density levels of said first picture elements in each first picture element region; and
determining the density levels of said second picture elements in each second picture element region as black or white according to said average value and the order in magnitude of said density level data.

4,323,975
ARTICULATED LOADING ARM CONTROL SYSTEM

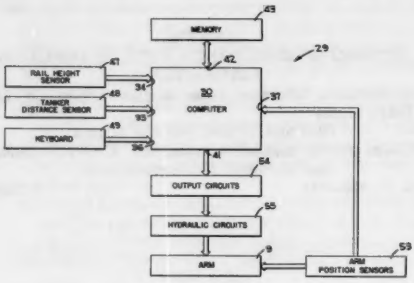
Peter Ball, Sheffield, England, assignor to FMC Corporation, Chicago, Ill.

Filed Jan. 28, 1980, Ser. No. 115,660
Claims priority, application United Kingdom, Jan. 31, 1979, 03468/79
Int. Cl.[3] B67D 5/68
U.S. Cl. 364—559 5 Claims

1. A system for controlling the position of an articulated loading arm used to load and unload a tanker, said loading arm being mounted on a loading station, said system comprising:
a computer for receiving signals from a plurality of signal sources and for producing control signals to control the movement of said loading arm;
a distance sensor for providing a signal proportional to the distance between a tanker and said loading station;
a rail height sensor for providing a signal proportional to the height of a tanker rail relative to said loading station;
a plurality of arm position sensors for providing signals determined by the spatial position of an outer end of said loading arm relative to said loading station;

a computer memory connected to said computer and to said sensors for storing said arm position signals, said distance signals and said rail height signals; and

a keyboard connected to said computer for providing signals



to said computer to cause said computer to compare the spatial position of said outer end of said loading arm with the position of said tanker and cause said computer to develop said control signals to move said loading arm into position for connecting said loading arm to said tanker.

4,323,976

ELECTRONIC DEVICE FOR TAKING THE SPEED OF A ROTATING MEMBER

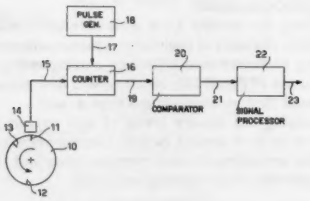
Dario Radaelli, Legnano; Giancarlo De Angelis, Milan, and Alberto Catastini, Corsico, all of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

Filed Jul. 31, 1979, Ser. No. 62,481

Claims priority, application Italy, Aug. 9, 1978, 26635 A/78

Int. Cl.³ G01P *3/42*

U.S. Cl. 364—565 **4 Claims**



1. An electronic device for providing a digital signal indicating the rotational speed of a rotating member which rotates at a variable speed within a preselected speed variation range, said speed variation range being subdivided into a preset number of zones and each zone being further subdivided into a preset number of intervals, sequential indicator numerals corresponding to said zones with said numerals being in a decreasing order of magnitude starting with a numeral indicating said zone of maximum speed, said device comprising transducer means operatively connected to said rotating member to generate for every revolution of said rotating member a first train of impulses spaced in time in a manner inversely proportional to the speed of rotation of said rotating member, impulse generating means for generating a second train of impulses at a constant frequency, counting means operatively connected to said transducer means and to said impulse generating means for receiving said trains of impulses, said counting means including means operable to effect the counting of the impulses of the second train of impulses and to be actuated to start and to stop said counting of impulses by two selected successive impulses of the first train of impulses, comparator means operatively connected to said counting means for comparing the number of impulses totalized by said counting means during the counting operation with reference values between a predetermined minimum value and a predetermined maximum value corresponding to the lower limit of said speed variation range and the maximum speed of said speed variation range and being operable to evaluate whether the number of impulses totalized is between said minimum value and said maximum value or whether said number of pulses is higher than said maximum value, processing means controlled by said comparator means for generating an output signal corresponding to said number of impulses totalized if said number is between said minimum value and said maximum value and to manipulate said number of impulses totalized if said number is greater than said maximum value until the number assumes a value between said minimum value and said maximum value to generate an output signal corresponding to the number of impulses calculated through said manipulation, said comparator means and said processor means being parts of a programmed microprocessor comprising a first register into which are successively loadable a first fixed value corresponding to the total number of intervals into which said speed variation range is subdivided, a second fixed value corresponding to said maximum value and a third fixed value corresponding to said minimum value and spaced from said second fixed value by a number corresponding to the number of intervals into which every zone of the range of speed is subdivided, a second register into which is loaded said number of impulses totalized by said counting means, a programmable counter for counting from one to another of said series of numerals indicative of the various zones of the speed variation range starting from that numeral corresponding to the zone of maximum speed, divisor means, subtractor means, and an output accumulating register to which said programmable counter delivers zone identifying numeral data as numeral data indicative of the counting state of said programmable counter, and said microprocessor being programmed to compare the number loaded into said second register with the fixed value loaded time by time into said first register and to divide said number loaded into said second register by selected coefficients of division to obtain a demultiplied number to be substituted for said loaded number in such a way that:

(a) if, with said first register loaded with said first fixed value, the number loaded into the second register is lower than said first fixed value, said microprocessor commands the commutation of said first register from said first fixed value to said second fixed value;

(b) if, with said first register loaded with said second fixed value, the number loaded into the second register is lower than said second fixed value, said microprocessor commands the commutation of said first register from said second fixed value to said third fixed value;

(c) if, with said first register loaded with said first fixed value or said second fixed value, the number loaded into said second register is higher than said first fixed value or respectively said second fixed value, said microprocessor commands the programming of said programmable counter and the actuation of said divisor means to obtain from said loaded number a demultiplied number and the loading of the demultiplied number, to be substituted for the number previously loaded, into said second register;

(d) if, with said first register loaded with said third fixed value, the number loaded into said second register is higher than said third fixed value, said microprocessor commands the subtractor means to subtract the loaded number from a fourth fixed value equal to said second fixed value minus one and to transmit the difference to said accumulating register as a datum of interval to be combined with the zone identifying datum delivered by said programmable counter; and

(e) if, with said first register loaded with said third fixed value, the number loaded into said second register is lower than said third fixed value, said microprocessor directly transmits to said accumulating register a signal indicative

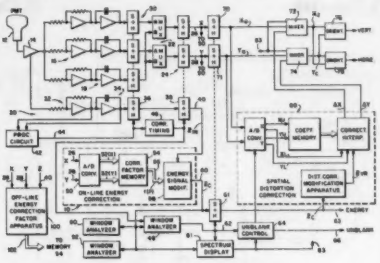
of a datum of interval higher than the maximum speed considered.

4,323,977

NON-UNIFORMITY ENERGY CORRECTION METHOD AND APPARATUS

Roger E. Arseneau, Arlington Heights, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Nov. 20, 1979, Ser. No. 96,181
Int. Cl.[3] G01T 1/20
U.S. Cl. 364—571 10 Claims



1. Correction apparatus for a scintillation camera, the scintillation camera providing image event position coordinate data and image event energy signals for each image event that occurs during on-line use of the scintillation camera, the correction apparatus comprising:

memory means having stored therein correction factors in an addressable data array format, said correction factors representing the non-uniformity of the energy response of the scintillation camera as a function of image event position over the image field of the scintillation camera;

means responsive to the image event coordinate position signal of each image event to control the memory means to read out the correction factor corresponding to each image event; and

image event energy signal correction means responsive to the uncorrected image event energy signal for scaling said read-out correction factor and using said scaled correction factor for generating a corrected image event energy signal.

4,323,978

ARITHMETIC ELEMENT BASED ON THE DDA PRINCIPLE

Reimar Hoefert, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1979, Ser. No. 102,201
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853540
Int. Cl.[3] G06F 7/64
U.S. Cl. 364—702 6 Claims

1. An arithmetic element for processing digital input increment signals, the frequency of which indicates an analog quantity, notably digital input increment signals comprising a sign signal according to the DDA (digital differential analyzer) principle, comprising at least one arithmetic device for executing add and subtract operations (adder/subtractor) and at least one operand register which is connected to a data input of the arithmetic device, characterized in that the arithmetic device comprises:

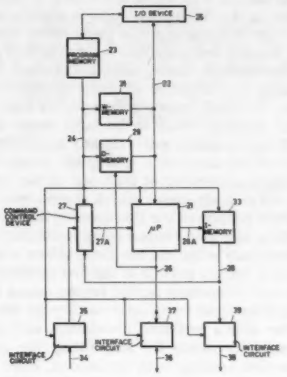
(a) a program memory (23) for supplying program signals on a first output (24);

(b) a microprocessor (21) with a first input which can be coupled to said first output and having an adder/subtractor (51) with a data output (26);

(c) a command control device (27) which is connected between said first input and first output and which comprises a second input for receiving a control signal in order to modify a program signal;

wherein there are furthermore provided:

first EXCLUSIVE-OR-means (71) having inputs connected to the most significant bit position (65) on said data output and to the most significant bit position on said operand



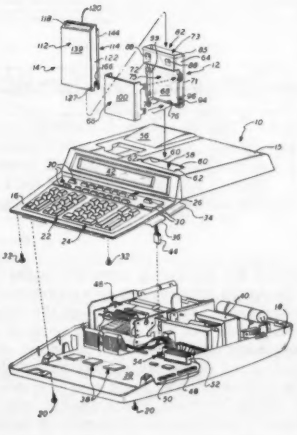
register (29) for generating a value signal (Δz) of an output increment signal and second EXCLUSIVE-OR-means (73) having inputs connected to the most significant bit position on said data output and to a location overflow bit position (66) for generating a sign signal (sign Δz) of the output increment signal.

4,323,979

CARTRIDGE AND BEZEL ASSEMBLY FOR A CALCULATOR

John N. Johnston, North Plainfield, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed Aug. 20, 1979, Ser. No. 68,010
Int. Cl.[3] G06F 1/00
U.S. Cl. 364—708 11 Claims



1. In a calculator comprising:

a housing having a first opening in the surface thereof, said first opening having at least one first inner surface portion having a substantially larger first radius of curvature than the second radii of curvature of the other, second inner surface portions of said first opening; and

a connector having an outer surface and being disposed within the housing and rendered accessible from the exterior of the housing via the first opening for electrically connecting to the calculator circuitry disposed on a medium which is separate from the calculator;

the improvement comprising:

guide means having a cross-section which is sustantially the same shape as the first opening and is slightly smaller than the size of the first opening, said guide means being separate from the housing and insertable within the first opening for guiding the medium, during insertion thereof, through the first opening into effective electrical connection with the connector, the guide means defining at its inner end a second, inner opening which is the same shape as the outer surface of the connector and is slightly larger than the outer dimension of the connector, said guide means having first keying means comprising at least one of the outer surface portions of the guide means which corresponds to the first inner surface portion of the first opening and defines a bevelled surface, said guide means being insertable through the first opening only when the bevelled surface is aligned with the first inner surface portion of the first opening, said guide means further comprising second keying means for preventing the medium from being inserted through the first opening in other than a preferred orientation, said guide means further including means for snap-fitting the guide means within the first opening with the second, inner opening of the guide means engaging the outer surface of the connector when the guide means is inserted through and snap fit in the first opening, whereby the guide means remains fixed relative to the housing and the connector after the guide means is inserted into the first opening.

4,323,980

DIGITAL FILTER FOR SHARED-TIME PROCESSING ON SEVERAL CHANNELS

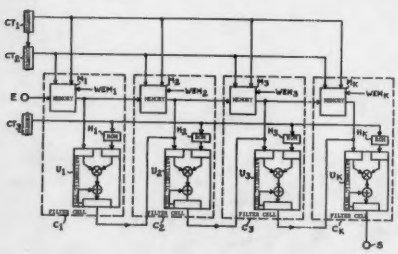
Jean-Pierre Houdard, Orsay; Jean-Jacques Julie, Paris, and Bernard G. Leoni, Brundy, all of France, assignors to Le Materiel Telephonique Thomson-CSF, Columbes, France

Filed Jan. 17, 1980, Ser. No. 113,039

Claims priority, application France, Jan. 29, 1979, 79 02163

Int. Cl.³ G06F *15/31*

U.S. Cl. 364—724 **6 Claims**



1. A method for processing successive signal samples, for example, the signals which appear on a plurality of time-multiplexed transmission channels, comprising the steps of: during each sampling time slot and for each channel, writing the current sample into one of a plurality of random access memories in place of the oldest priorly written sample, all of the samples for a given channel being read into said memory in succession starting with that which has just been written and progressing to other memories in the order of increasing age to the oldest sample; simultaneously reading all of said memories in the order of increasing age starting with the sample which has just been written; sending the samples thus read from each memory to a corresponding arithmetic unit; summing the results produced by the different arithmetic units; and then, said progressing of memories comprising transferring the oldest sample from each memory to the next memory, starting with the next to last memory, said memories being arranged in the order of increasing age of their contents.

4,323,981

CENTRAL PROCESSING UNIT WITH IMPROVED ALU CIRCUIT CONTROL

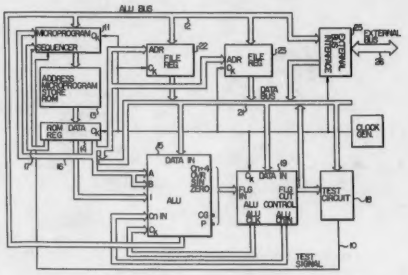
Norimitsu Nakamura, Oume, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 23, 1978, Ser. No. 953,743

Claims priority, application Japan, Oct. 21, 1977, 52-125778

Int. Cl.³ G06F *7/50*

U.S. Cl. 364—749 **15 Claims**



1. An information processor for performing processing operations upon externally supplied data including control data under the control of a microprogram comprising:

a read only memory for storing microprograms at associated execution addresses, each said microprogram comprising a set of processing instructions;

a microprogram sequencer connected to said read only memory for producing the execution address of a said stored microprogram and for controlling said read only memory to output said instructions comprising said microprogram associated with said produced execution address;

a read only memory data register connected to said read only memory for latching the instructions outputted from said read only memory;

a data bus for receiving said data including said control data;

a register file connected to said data bus for receiving data including said control data therefrom;

an arithmetic/logic unit comprising a plurality of ALU chips of a selected bit length connected to said read only memory data register for receiving said outputted instructions and to said register file for receiving data from said register file and for performing processing operations on said data received from said register file in response to said instructions received from said read only memory data register, each of said ALU chips having associated therewith flag data including a carry flag signal, a sign flag signal, a zero flag signal, and an overflow flag signal for indicating the status of said associated ALU chip; and

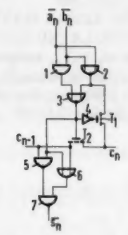
ALU circuit control means connected to said arithmetic/logic unit and said data bus for selecting ALU chips in accordance with said instructions latched in said read only memory data register so as to carry out said processing operations on said data provided by said register file in accordance with said instructions of said latched microprogram, wherein each of said performed operations is constituted of bits the number of which is defined by the selected ALU chips, said ALU circuit control means for selecting said carry flag signal, said sign flag signal, said zero flag signal, and said overflow flag signal associated with one of said selected ALU chips in accordance with said received data to indicate the status of said arithmetic/logic unit.

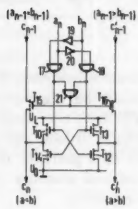
4,323,982

LOGIC CIRCUIT ARRANGEMENT IN THE INTEGRATED MOS-CIRCUITRY TECHNIQUE

Dieter Eichrodt, and Friedhelm Elsen, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 841,798, Oct. 13, 1977, abandoned.
This application Nov. 16, 1979, Ser. No. 94,931
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647982
Int. Cl.[3] G06F *7/50, 7/38*
U.S. Cl. 364—786 2 Claims





1. In a multi-stage logic circuit formed as an integrated MOS circuit,

an addition stage for each digit of multi-digit numbers to be added,

each one of said addition stages except the first one having an input for receiving a carry signal from a preceeding addition stage of a previous lower-value digit and each of said addition stages except the last one having a carry signal output which is coupled to the carry signal input of the following stage for the next higher value digit,

said addition stages having first and second adding means, said first adding means including inputs receiving said digits of said numbers to be added, said first adding means having a first output providing a first logic value representing the sum of said digits of said numbers to be added, and a second output providing a carry signal, and

said second adding means including inputs for receiving the carry value of the preceeding addition stage and and inputs for receiving the value representing the sum of said digits of said numbers to be added and an output providing a logic value representing the sum for the addition stage;

each of said addition stages having a transfer gate,

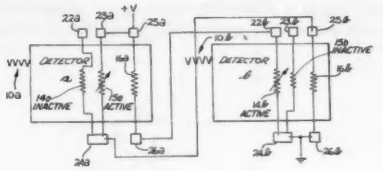
said transfer gates each having a first arm coupled between said second output of said first adding means and said carry signal output and including a single first transfer transistor, a second arm coupled between said carry signal input and said carry signal output and including a second single transfer transistor, and an inverter having an input coupled to said first output of said first adding means and an output coupled to a control electrode of said first single transfer transistor, a control electrode of said second single transfer transistor coupled to said first output of said first adding means, whereby a carry signal generated in said first adding means is transferred by said first single transfer transistor to said carry signal output and a carry signal from said carry signal input is transferred by said second single transfer transistor to said carry signal output.

4,323,983

MAGNETIC BUBBLE DETECTOR

David M. Lee, Santa Clara; Donald K. Rose, Palo Alto, and Richmond B. Clover, Sunnyvale, all of Calif., assignors to Intel Magnetics, Inc., Santa Clara, Calif.

Filed Aug. 9, 1979, Ser. No. 65,361
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—8 6 Claims



1. An apparatus for detecting magnetic bubbles which are propagated in a layer of magnetic material under the influence of a rotating magnetic field comprising:

a first and second magnetoresistive detector, each comprising:

an expander means for expanding the size of magnetic bubbles;

a first active magnetoresistive element adjacent to said expander means;

a second inactive magnetoresistive element adjacent to said first element; and

a dummy element for balancing out the effects of said rotating magnetic field;

sensing circuit for sensing the change of resistance in magnetoresistive elements, said sensing circuit coupled to said first element of said first detector and said second element of said second detector;

whereby two independent streams of spaced-apart bubbles coupled to said first and second detectors are sensed.

4,323,984

SWITCHING EQUIPMENT USING MAGNETIC DOMAINS

Hideo Ishihara, Kamakura; Shizuo Suzuki, Yokohama, and Satoru Nakabo, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1978, Ser. No. 957,347
Claims priority, application Japan, Nov. 4, 1977, 52-131488
Int. Cl.[3] G11C *11/15, 13/06*
U.S. Cl. 365—10 11 Claims

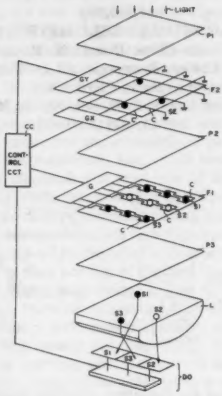
1. A switching equipment using magnetic domains, comprising:

a magnetic sheet having the property of producing magnetic domains respectively at a plurality of storage positions arranged in a matrix form,

first input control means responsive to selection signals for setting the magnetic domains at the plurality of storage positions on the magnetic sheet to either one of two states in accordance with the states of a plurality of selection signals,

means defining an information surface in registration with said magnetic sheet and capable of indicating binary information at each of a plurality of indication positions arranged in a matrix respectively corresponding to the plurality of storage positions of the matrix of said magnetic sheet,

second input control means responsive to input signals for setting the state of the binary information of each of the plurality of indication positions along respective rows or columns of the matrix of the information surface to the same signal state as one another and to the states of respective ones of the input signals, and



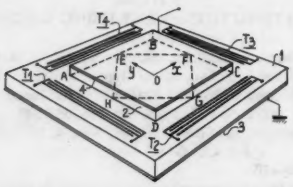
output means for obtaining a plurality of logical products of corresponding ones of the magnetic domains at the plurality of storage positions on the magnetic sheet and the binary information at the plurality of indication positions on the information surface to derive the logical products as one dimensional information, the input signals being exchanged in accordance with the states of the selection signals and provided as the one dimensional information.

4,323,985

TWO DIMENSIONAL ACOUSTO-ELECTRICAL DEVICE FOR STORING AND PROCESSING INFORMATION

Charles Maerfeld, and Herve Gautier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 29, 1980, Ser. No. 116,477
Claims priority, application France, Feb. 2, 1979, 79 02766
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—157 **19 Claims**



1. A two dimensional acousto-electric device for storing and processing an analog input signal comprising:

a piezoelectric medium, carrying at least two electromechanical transducers capable of generating elastic waves at the surface of said piezoelectric medium in at least two separate directions;

an electrically non linear medium in which non linear interactions are apt to occur between electrical fields associated with said elastic waves;

a medium for storing electric charges, said medium being electrically coupled to said non linear medium;

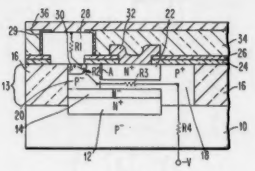
the storage of said analog input signal being achieved by means of at least two auxiliary writing signals, at least two of these three signals, i.e. the analog input signal and the writing signals, being applied to said electro-mechanical transducers, and the third being applied to the device, the frequencies of said auxiliary signals being such that the non linear interaction of the three signals supplies a fourth signal, representing the input signal, independent of time, in the form of a periodic spatial distribution of electric charges stored in said storage medium.

4,323,986

ELECTRONIC STORAGE ARRAY HAVING DC STABLE CONDUCTIVITY MODULATED STORAGE CELLS

Shashi D. Malaviya, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,646
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—174 **14 Claims**



1. An integrated circuit semiconductor storage array formed on a monolithic substrate, having a plurality of conductivity modulated storage cells each contained within a single isolation zone of said substrate, at least one of a plurality of word lines and at least one of a plurality of bit lines electrically contacting each one of said plurality of conductivity modulated storage cells, comprising:

a first semiconductor region formed into said isolation zone and consisting of a lightly doped P type region forming a variable resistance and a highly doped P type region forming a fixed resistance, the difference in doping level between the lightly and highly doped regions being at least one order of magnitude;

a second semiconductor region formed into said first semiconductor region to form a PN junction therewith and consisting of a highly doped N type region;

an electrical path extending from said at least one of a plurality of word lines through at least a portion of said first and second semiconductor regions to said at least one of a plurality of bit lines;

a first potential source for applying a relatively positive potential to the said at least one word line;

a second potential source for applying a relatively negative potential to the highly doped portion of said first region; and

a third potential source for applying a variable potential, having first and second levels, to said at least one bit line, said third potential in its first level being insufficiently negative with respect to the level of said first potential source to establish a potential difference for forward biasing said PN junction thereby inhibiting current flow in said electrical path, said third potential in its second level being selectively more negative with respect to said first potential source sufficient to establish a potential difference for forward biasing said PN junction, thereby injecting electrons into said lightly doped portion of said first semiconductor region and lowering its resistivity;

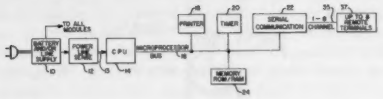
whereby current flow is maintained through said electrical path after said third potential source is brought to its first level.

4,323,987

POWER FAILURE MEMORY SUPPORT SYSTEM

Earl B. Holtz, Huntington; Roger F. Lay, Newtown; Flavio M. Manduley, Woodbury, and Howard J. Moody, Monroe, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 28, 1980, Ser. No. 134,738
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—229 17 Claims



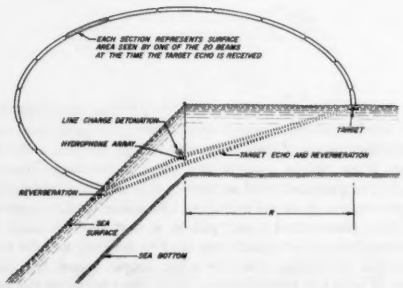
1. A data processing system comprising:
(a) volatile memory for storing data, said volatile memory having a given time within which data therein must be refreshed;
(b) first power supply for maintaining said data in said volatile memory;
(c) power sensing means for detecting a power failure of said first power supply;
(d) a second power supply for independently supplying power when said power sensing means detects a power failure of said first power supply;
(e) timing means operatively connected to said power sensing means for detecting a lapse of time from said power failure; and
(f) delay ouput means coupled to said volatile memory and connected to be operated by said second power supply for transferring said data from said volatile memory to an external device when said timing means indicates that a predetermined time interval has elapsed, said predetermined time interval being substantially greater than said time within which data in said volatile memory must be refreshed.

4,323,988

SONOBUOY SYSTEM

Albert S. Will, Bethesda; Earl A. Schuchard, Laurel; John P. Buckley; Armand Cioccio, both of Silver Spring; John C. Hetzler, Jr., Laurel; Sylvan Wolf, College Park, all of Md.; Donald E. Jefferson, Dobbs Ferry, N.Y.; Jim B. McQuitty, Hyattsville, and Robert A. Urick, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1966, Ser. No. 545,209
Int. Cl.[3] G01S *15/06*
U.S. Cl. 367—4 10 Claims


EACH SECTION REPRESENTS SURFACE AREA SEEN BY ONE OF THE 20 BEAMS AT THE TIME THE TARGET ECHO IS RECEIVED
LINE CHARGE DETONATION
HYDROPHONE ARRAY
TARGET
TARGET ECHO AND REVERBERATION
REVERBERATION
R
SEA SURFACE
SEA BOTTOM

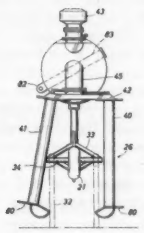
1. A sonobuoy system for underwater detection of a long range target over a wide detection area comprising,
a multibeam omnidirectional sonobuoy dropped in the vicinity of an underwater target having means for detecting acoustic signals in a plurality of beam sections simultaneously which sectors provide a 360° discrimination directional pattern, compass means for referencing said beam sectors and means for transmitting simultaneously compass information, and target range and target bearing information signals from each of said sectors to a remote location,
remote control means providing an initiating signal to said sonobuoy when the sonobuoy is in a predetermined detection position,
receiving means in said remote location for receiving and processing said information signals transmitted from said sonobuoy,
means electrically connected to said receiving means for discriminating between sectors having nontarget reverberation signals and a sector containing a target, and means for displaying said target range and bearing information.

4,323,989

WIDE SEISMIC SOURCE

Kermit D. Huckabee, Mandeville, La.; James C Adair, Bellaire, and Gene T. Worrell, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 29, 1980, Ser. No. 154,241
Int. Cl.[3] G01V *1/38*
U.S. Cl. 367—17 13 Claims

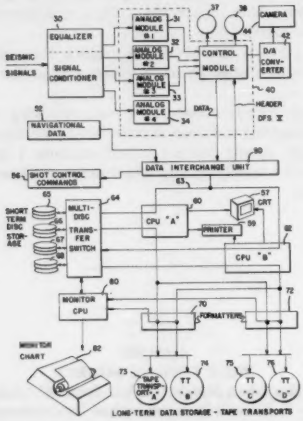


1. A wide seismic source for towing by a vessel while conducting a marine survey comprising:
a plurality of elongated floats, a rudder means attached to the leading edge of each float, each of said rudder means comprising two separate rudders, one of said rudders being mounted with its vertical axis substantially normal to the surface of the water when said float is in its normal towed orientation, the second rudder being mounted with vertical axis at an angle to the rotational axis of said one of said rudders, the angle between the two rotational axes being chosen to position one of said rotational axes normal to the surface of the water when said float rotates when towed;
tow means attached to said floats and the vessel for towing said floats;
an elongated boom member suspended below each of said floats;
steering means disposed on said elongated floats to control said rudder means to maintain the floats in a desired lateral position with respect to the remainder of said floats;
a plurality of seismic sources attached to each elongated boom member; and,
means for firing said seismic sources.

4,323,990
SEISMIC EXPLORATION SYSTEM

James W. Goode, Dallas; Wayne A. Penner, Farmers Branch; Charles D. Ray, Dallas, and Robert G. Nelson, Carrollton, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,299
Int. Cl.³ G01V *1/24, 1/38*
U.S. Cl. 367—21 **9 Claims**



1. In a marine seismic exploration vessel having means for producing pulses of seismic energy and means for detecting seismic signals reflected from the earth's subsurface, a seismic signal recording system comprising:

analog-to-digital converter means for converting the seismic signals produced after each pulse of seismic energy to digital traces in an exploration format;

at least two digital computers each having means for converting the exploration format of said digital traces to digital records in a processing format;

means for recording said digital records; and

means for continuously alternating said digital traces of said analog-to-digital converter means to different ones of said computers so that capacity of said system for recording seismic records in processing format is increased.

4,323,991
FLUIDIC MUD PULSER

Allen B. Holmes, Rockville; Stacy E. Gehman, Takoma Park, and Maurice F. Funke, Columbia, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 12, 1979, Ser. No. 74,636
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—83 **11 Claims**

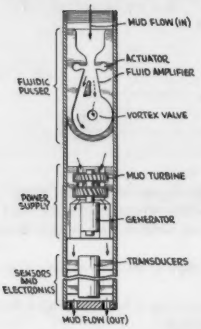
1. Apparatus for producing pulses in a fluid passing through a conduit, comprising

a bi-stable fluid amplifier having an inlet means for receiving at least a portion of the fluid passing through the conduit,

said bi-stable fluid amplifier further comprising two outlet paths, the fluid entering said inlet assuming and maintaining a stable flow condition through one of said two outlet paths,

a vortex valve associated with said fluid amplifier, a first of said outlet paths of the amplifier entering said vortex valve radially and a second of said outlet paths entering said vortex valve tangentially whereby said vortex valve will offer relatively low resistance to fluid flow when fluid enters said vortex valve through said first outlet path and relatively high resistance to fluid flow when fluid enters said vortex valve through said second outlet path,

control means associated with said fluid amplifier for abruptly altering said stable flow condition through said one outlet path, for deflecting the fluid entering said inlet toward the other of said outlet paths and for establishing and maintaining a stable flow condition through the other of said outlet paths,

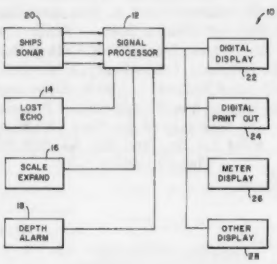


whereby the abrupt change in resistance to flow into and through said vortex valve results in abrupt changes in the rate of fluid flow into said inlet of said fluid amplifier, and pulses are generated in the fluid entering said amplifier.

4,323,992
DEPTH SOUNDER REPEATER STRUCTURE AND METHOD

Leo W. Tobin, Jr., Edwards Point Rd., Rumson, N.J. 07760

Continuation of Ser. No. 874,689, Feb. 2, 1978, abandoned, which is a continuation of Ser. No. 810,693, Jun. 28, 1977, abandoned, which is a continuation of Ser. No. 646,394, Jan. 2, 1976, abandoned. This application Nov. 1, 1979, Ser. No. 90,177
Int. Cl.³ G01S *15/14*
U.S. Cl. 367—108 **18 Claims**



1. A depth sounder repeater structure for use in conjunction with shipboard sonar which shipboard sonar produces main transmitted pulses of high frequency energy and receives echo pulses from distant underwater objects the time between which is representative of an underwater distance, comprising a signal receiving circuit including a first inverter for receiving the main transmitted sonar pulses, a first multivibrator for receiving the output signal from the first inverter and the echo pulses for producing a square wave output signal, the pulse width of which is representative of the time between the main transmitted sonar pulse and the first corresponding echo signal, a first differentiator circuit for receiving the square wave signal and producing a positive and a negative going trigger signal in response thereto, a display timing circuit including a one-shot multivibrator for receiving the negative going trigger signal representative of the time of receipt of the echo signal operable

to produce a second square wave output signal in response to the negative going trigger signal, and a second inverter circuit for inverting the second square wave signal, a differentiator connected to the second inverter for differentiating the inverted square wave output of the one-shot multivibrator to provide a display timing circuit trigger signal, a one and only one circuit including a third and fourth multivibrator, the third multivibrator being connected to the display timing circuit for receiving the display timing circuit trigger signal and operable on receipt of the display timing circuit trigger signal to prepare the fourth multivibrator to produce an output signal in response to the next following main transmitted sonar pulse through the first inverter, said fourth multivibrator being connected to receive the output signals from the first inverter and also being connected to receive echo input signals from the first differentiator operable to turn the fourth multivibrator off, said fourth multivibrator being operable on turning on to reset the third multivibrator so that the third multivibrator will not again prepare the fourth multivibrator to produce an output signal until the receipt of a further display timing circuit trigger signal, a timing oscillator, said fourth multivibrator being also operable to actuate the timing oscillator to produce periodic electric signals during the time the fourth multivibrator produces an output signal, and a display circuit including a plurality of binary coded decimal counters connected to receive the output impulses of the timing oscillator and to receive the display timing circuit trigger signal for resetting of the binary coded decimal counters, binary decoder structure connected to the binary coded decimal counters for decoding the binary coded decimal counter signals subsequent to the timing oscillator being shut off and a binary display circuit connected to the binary decoder circuits for providing a binary display of the distance between the sonar and the object which returned the first echo signal as represented by the electrical impulses from the timing oscillator in the time between a main sonar transmitted pulse and the corresponding first received echo pulse.

4,323,993

INDICATOR APPARATUS FOR DETERMINING THE MISS DISTANCE OF A PROJECTILE IN RELATION TO A FIXED OR MOVING TARGET

Olof Söderblom, Lidingö, and Lasse K. Karlsen, Solna, both of Sweden, assignors to Swedair AB, Stockholm, Sweden

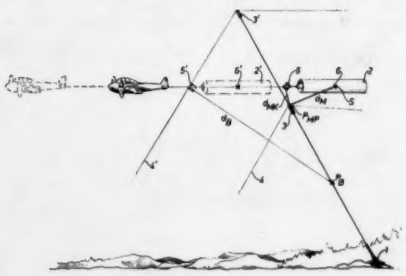
PCT No. PCT/SE78/00106, § 371 Date Jul. 26, 1979, § 102(e) Date Jul. 26, 1979, PCT Pub. No. WO79/00452, PCT Pub. Date Jul. 26, 1979

PCT Filed Dec. 28, 1978, Ser. No. 154,406

Claims priority, application Sweden, Dec. 29, 1977, 7714913

Int. Cl.³ G01S 5/18; F41J 5/12

U.S. Cl. 367—127 **6 Claims**



1. An indicator apparatus for determining a distance of a supersonic projectile in relation to a target, comprising:

at least four pressure sensing transducers for sensing the conical pressure wave generated by the supersonic projectile in at least four points, the at least four pressure transducers forming part of a first pressure transducer system,

means for measuring the time instants when the conical pressure wave is detected in the at least four transducers and for determining the time differences between the passages of the conical pressure wave past the at least four transducers in the first pressure transducer system;

means for detecting the pressure wave characteristics and generating electrical signals therefrom;

computing means coupled to said detecting means for calculating based on said electrical signals the distance from one pressure transducer to the point from which the conical pressure wave originated, the so-called "bang generation point";

said at least four transducers being arranged at the corners of a polyhedron, having as many corners as the number of transducers and being given fixed positions in a coordinate system with a known position relative to the target;

means for computing the direction of the speed vector of the conical pressure wave relative to said coordinate system from the determined time differences and thus the position of the bang generation point from the calculated distance to the bang generation point, thereby obtaining a first point on the projectile trajectory;

a second transducer system for sensing the firing time instant and including means for measuring the time from firing until the pressure wave is detected by said one pressure transducer in the first transducer system in order to determine the projectile speed and hence the apex angle of the conical pressure wave and thus the unit vector from the bang generation point to the firing point, said unit vector thereby defining the direction of the projectile trajectory, which together with the position of the bang generation point gives the trajectory per se; and

means for computing the size and direction of the vector between said coordinate system and the projectile at an arbitrary time instant and determining this vector when it has a certain size.

4,323,994

GEOPHONE SPRING

John M. Coogler, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Filed Mar. 31, 1980, Ser. No. 136,291

Int. Cl.³ G01V 1/16; F16F 1/34

U.S. Cl. 367—183 **4 Claims**

1. A spring, for use in geophones to suspend an inertial mass structure from a fixed reference rigid support structure, which structures are coil and magnet assemblies, comprising:

an outer member;

an inner member; and

a plurality of leg members connecting the outer and inner members wherein each leg member is comprised of:

a substantially straight segment;

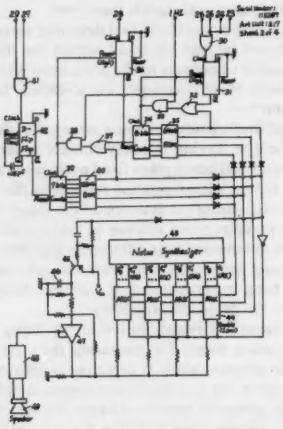
an outer arcuate segment connecting the substantially straight segment to the outer member; and

an inner arcuate segment connecting the substantially straight segment to the inner member.

4,323,995
CHIME UNIT FOR ELECTRIC CLOCK AND MECHANICAL CLOCK

Te-Long Chiu, 6990 Grandwood Way, San Jose, Calif. 95120

Filed Jan. 18, 1980, Ser. No. 113,287
Int. Cl.³ G04B 21/02, 21/00
U.S. Cl. 368—75 6 Claims



1. An electronic chime unit for electric and the mechanical clock comprising:

a quarter hourly signal generator consisting of quarter hourly position sensors, a flip flop, and a plurality of logic gates to receive a low frequency pulse as gating signal, and to a deliver quarter hourly triggerring signal to a quarter hourly address counter and to provide a feedback signal to reset the said flip flop back to original state after delivering the quarter hourly signal to quarter a hourly address counter;

a quarter hourly address counter to receive the triggerring signals from the said quarter hourly signal generator and from an output terminal of a quarter hourly chime memory, and to receive a reset signal from an hourly signal generator, and to provide address signals to the said quarter hourly chime memory;

a quarter hourly chime memory to receive address signals from the said quarter hourly address counter, and to provide notes selection signals to a chime note generation circuit, and to provide the triggerring signal to the said quarter hourly address counter when the quarter hourly chime music is not completed, and to provide an enable signal to the chime note generation circuit, and to provide the activation signal to a decay generator to initiate the R C discharging of the voltage;

an hourly signal generator consisting of an hourly position sensor, a flip flop, and plurality of logic gates to receive a low frequency pulse as gating signal, and to deliver an hourly triggerring signal to said hourly address counter, and to provide feedback signal to reset the said flip flop back to the original state after delivering the hourly triggerring signal to an hourly address counter, and to deliver a reset signal to the said quarter hourly address counter;

an hourly address counter to receive triggerring signals from the said hourly signal generator, and from an output terminal of an hourly chime memory, and to receive reset signal from post 12 o'clock signal generator, and to provide an address signal to said hourly chime memory;

an hourly chime memory to receive address signals from said hourly address counter, and to provide note selection signals to a chime note generation circuit, and to provide the triggerring signal to the said hourly address counter when the hourly chime music is not completed, and to provide the enable signal to the chime note generation circuit, and to provide the activation signal to the decay generator to initiate the R C discharging of the voltage;

a post 12 o'clock signal generator consisting of post 12 o'clock position sensor, a flip flop, and a capacitor, and an AND gate to deliver post 12 o'clock reset signal to said hourly address counter;

a memory signals combiner consisting of a plurality of diodes to combine the output terminals of the said quarter hourly chime memory and those of the said hourly chime memory into a single set of common output terminals;

a notes synthesizer to generate a set of single frequency notes as the input signals to the input lines of a chime note generation circuit;

a chime note generation circuit consisting of a plurality of multiplexers having common address lines and a common enable terminal to receive a specific different single frequency note at each of their input lines from said notes synthesizer, and to receive from the said common output terminals of the said memory signals combiner the notes selection signals and enable signal, respectively, at the common address lines and the common enable line, and to mix the single frequency notes at the output terminals of the said multiplexers through resistors and deliver the mixed notes as a chime note to the input terminal of the voltage controlled amplifier;

a decay generator consisting of a transistor, and a plurality of resistors and capacitors to receive the activation signal from one of the common output terminals of the said memory signals combiner to initiate the R C discharging of the voltage, and to deliver the decaying voltage to a gain control terminal of a voltage controlled amplifier;

a voltage controlled amplifier to receive the decaying voltage from the said decay generator to the gain control terminal, and to receive the chime note from the said chime note generation circuit, and to deliver the decaying chime note at the output terminal to the input terminal of the audio amplifier;

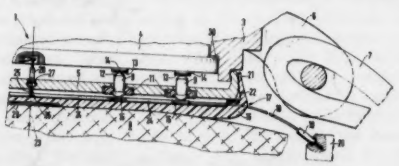
an audio amplifier to receive the decaying chime note from the said voltage controlled amplifier, and to deliver the amplified decaying chime note at the output terminal to the input terminals of an electro-mechanical transducer;

an electro-mechanical transducer to convert the amplified decaying chime note from the said audio amplifier into the audible chime sound.

4,323,996
ELECTRONIC WRISTWATCH HAVING ELECTRIC TERMINAL CONTACTS

Wolfgang Ganter, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Sep. 16, 1980, Ser. No. 187,537
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940246
Int. Cl.³ G04C 23/02; G04B 1/00, 37/00
U.S. Cl. 368—88 13 Claims



1. An electronic wristwatch comprising:

a housing,

a clock module disposed within said housing,

said module including electric contact surfaces,

first electric contacts electrically connected with said

contact surfaces and arranged on a bottom side of said housing, said first contacts enabling said module to be electrically connected to an auxiliary device, and

interchangeable bottom cap individually attachable to said housing over said first contacts and sized to enable the watch to be worn on a wearer's arm when a bottom cap is attached,

said bottom cap including second electric contacts arranged to engage different ones of said first contacts depending upon which bottom cap is attached to said watch, said bottom cap further including electrical connector means for attachment to an auxiliary device to electrically interconnect said module and the auxiliary device.

4,323,997

LINEAR-TRACKING PICK-UP ARM DRIVE ASSEMBLY

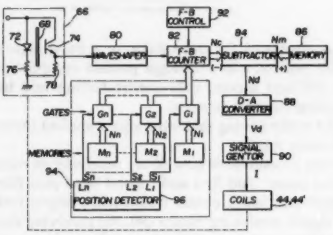
Hiroshi Kuribayashi, and Atsuo Ikeda, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 41,403, May 21, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 192,171

Claims priority, application Japan, May 23, 1978, 53-61228; May 12, 1979, 54-58179; 05121979, May 12, 1979, 54-58180

Int. Cl.³ G11B *19/14, 17/06*

U.S. Cl. 369—33 **5 Claims**



1. A linear-tracking pick-up arm drive assembly for a disc player, comprising at least one elongate stationary guide member, a movable unit having a pick-up arm supported thereon and longitudinally movable on and along said guide member, the pick-up arm being movable with said movable unit to and from a predetermined reference position, electrically operated drive means operative to drive said movable unit on and along said guide member, a rotary disc rotatable with the longitudinal movement of said movable unit, distance detecting means responsive to the rotational movement of said rotary disc and operative to produce a train of pulses representative of the distance of the pick-up arm moved from said reference position thereof, and a control circuit responsive to the pulses from said distance detecting means for energizing said drive means in accordance with the pulses from the distance detecting means, said control circuit comprising (A) a memory circuit operative to have stored therein a set of pulses representative of a predetermined distance of the pick-up arm from said reference position thereof, (B) a presettable forward-backward counter having a presetting terminal and an input terminal which is connected to said distance detecting means, the forward backward counter being operative to forwardly and backwardly count the pulses from said distance detecting means when said pick-up arm is being moved away from or toward said reference position thereof, (C) a subtractor connected between said memory circuit and said forward-backward counter and operative to produce a differential signal representative of the difference between the number of the pulses from the memory circuit and the number of the pulses from the forward-backward counter, (D) a control signal generator having an input terminal connected to said substractor for converting said differential signal into a control signal for said drive means, and (D) signal correcting means responsive to predetermined transitive positions of the pick-up arm with respect to said reference position thereof and connected to the presetting terminal of said forward-backward counter, said signal correcting means being operative to produce pulses corresponding in number to each of said predetermined transitive positions of the pick-up arm and to preset the forward-backward counter when the pick-up arm is moved into each of said transitive positions, said signal correcting means comprising an arm position detector operative to produce pulses representative of said transitive positions of the pick-up arm, gate circuits having respective trigger terminals responsive to the pulses representative of said transitive positions, respectively, the gate circuits having respective output terminals jointly connected to the presetting terminal of said forward-backward counter; and memory circuits having respective output terminals respectively connected to the input terminals of said gate circuits, the memory circuits being operative to have stored therein signals which are respectively representative of the distances between said reference position and said transitive positions of the pick-up arm.

4,323,998

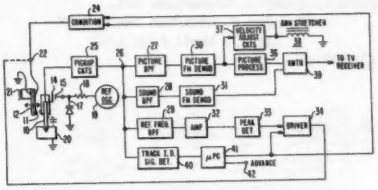
VIDEO DISC LOCKED GROOVE CORRECTOR

Kazuo Fukazawa, and Akira Yamada, both of Tokyo, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Aug. 21, 1980, Ser. No. 180,389

Int. Cl.³ G11B *21/08*

U.S. Cl. 369—43 **15 Claims**



1. In a video disc player in which a signal pickup stylus cooperates with a disc record for recovering signals recorded in information bearing tracks during playback, said disc being subject to rotation to create relative velocity between the pickup stylus and the disc record, said information bearing tracks tending to be eccentric to the axis of rotation of said disc, and said disc being subject to having physical defects tending to disengage the pickup stylus from said tracks and to interfere with the normal progression of the signal pickup stylus across the record, apparatus for translating the signal pickup stylus radially across said disc comprising:

a carriage;

a stylus arm having said signal pickup stylus fixed at a first end, and having a second end;

means for securing the second end of the stylus arm to said carriage, the first end of the stylus arm being free to move relative to said carriage;

a longitudinal flexible member having a first end secured to said carriage at a point separate and distinct from said stylus arm and having a second end arranged proximate the first end of the stylus arm, said flexible member yieldably engaging the stylus arm during normal progression of the signal pickup stylus across the disc record and resisting disengagement of the pickup stylus from said information tracks due to disc defects.

4,323,999

AUTOMATIC TRANSMISSION OR RECORDING OR TRANSMISSION AND RECEPTION CONTROL SYSTEM

Naomi Yoshizawa, and Akira Terashima, both of Hatano, Japan, assignors to Pilot Mannenhitsu Kabushi Kaisha, Tokyo, Japan

Filed Apr. 28, 1980, Ser. No. 144,518
Claims priority, application Japan, Feb. 29, 1980, 55-24105
Int. Cl.³ G11B *15/00*
U.S. Cl. 369—19 **13 Claims**

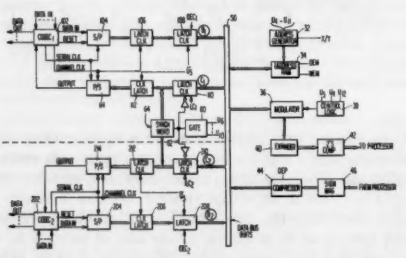
6. An automatic recording control system employed in a recorder having a vibration pick-up microphone insertable in the external auditory canal of a user for picking up bone-conducted voice signals wherein tooth clicks of the user, transmitted through bones are picked up by the microphone means are provided for producing control signals from said tooth clicks, and means responsive to said control signals for the change-over of recording and end of recording stop according to the input order in which control signals are applied.

4,324,000

TERMINATION CIRCUIT FOR FDM/TDM PROCESSORS

Zaheer M. Ali, Santa Maria, Calif., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jan. 9, 1980, Ser. No. 110,590
Int. Cl.³ H04J *1/05, 3/02*
U.S. Cl. 370—85 **11 Claims**



11. In a data transmission system having first and second data sources each having a first number of channels, a memory for receiving data provided by said sources, data processing means for receiving data provided by said memory and having a second number of channels being greater than said first number of channels, data flow control means for controlling the flow of data from said first and second data sources to said memory and from said memory to said data processing means, and memory address control means for controlling the location of data received by and transmitted from said memory,

a method of multiplexing said first and second data sources comprising:

(a) alternately providing said memory with data from said first and second data sources;

(b) writing said alternately provided data into said memory at first and second alternating and increasing memory locations during memory write cycles said first and second alternating memory locations being separated in said memory by a number of locations substantially equal to said first number of channels;

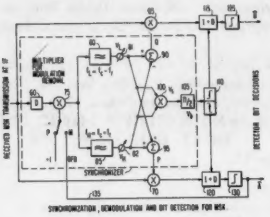
(c) interleaving said memory write cycles with memory read cycles wherein data words are read from said memory at third increasing memory locations and provided to said data processing means.

4,324,001

SYNCHRONIZER FOR MSK BURST COMMUNICATIONS

Smith A. Rhodes, Falls Church, Va., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Aug. 15, 1980, Ser. No. 178,411
Int. Cl.³ H04L *27/10*
U.S. Cl. 375—90 **12 Claims**



1. An apparatus for demodulating a burst signal having a preamble portion and a message portion comprising

first (70) and second (65) mixers having said burst signal applied directly thereto;

a third mixer having said burst signal applied thereto by way of delay means;

first and second band pass filters receiving an output of said third mixer, said first and second band pass filters having upper and lower center frequencies, respectively;

first signal combining means (90, 95) receiving outputs from said first and second band pass filters for providing first and second reference signals in phase quadrature, said first and second reference signals being applied to said first and second mixers, respectively, to thereby demodulate said burst signal with (i) said first reference signal in said first mixer and (ii) said second reference signal in said second mixer;

second signal combining means receiving outputs from said first and second band pass filters for providing first and second timing signals;

first and second data generating means receiving outputs from said first and second mixers, respectively, for generating first and second binary signals under the control of said first and second timing signals;

means (135) for applying said first binary signal to said third mixer when said message portion of said burst signal is being received to thereby demodulate the polarity of said message portion in accordance with said first binary signal; and

means for applying a constant signal level to said third mixer when said preamble portion of said burst signal is being received to thereby avoid polarity demodulation of said preamble portion of said burst signal.

4,324,002

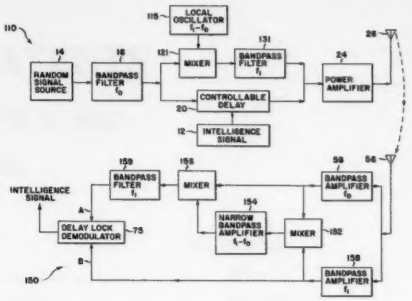
DELAY-MODULATED RANDOM ENERGY INTELLIGENCE COMMUNICATION SYSTEM

James J. Spilker, Jr., Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Mar. 18, 1960, Ser. No. 17,729
Int. Cl.³ H04K *1/00*
U.S. Cl. 455—27 **8 Claims**

1. An intelligence communication system comprising a

transmitter and a receiver; said transmitter comprising non-periodic energy means for generating a carrier, means for effecting a change in the time or frequency domain of the carrier signal whereby a reference signal is generated, means for effecting a variable delay in said carrier signal in accordance with the intelligence to be communicated whereby a message signal is generated, and means for radiating the reference and message signals; said receiver comprising means for picking up the reference and message signals, means for effecting a change in the picked up signal which change is complementary with that caused by first said change effecting means, and means responsive to said picking up means and last said change effecting means for deriving the intelligence signal therefrom.



DESIGN PATENTS

GRANTED APR. 6, 1982

ERRATA

For CLASS	See PATENT NO.
D32–070	263,672
D34–024	263,690
D34–026	263,691
D34–029	263,692

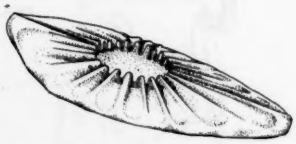
DESIGNS

APRIL 6, 1982

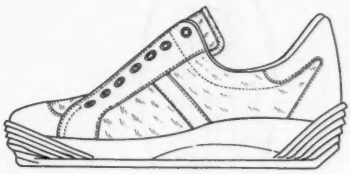
263,640
PATIENT SUPPORTING HARNESS OR SIMILAR ARTICLE
Rutger Nandorf, S-593 00 Västervik, Sweden
Filed Dec. 11, 1979, Ser. No. 102,565
Claims priority, application Sweden, Jun. 11, 1979, 79-1437
Term of patent 7 years
Int. Cl. D2—*02, 07*
U.S. Cl. D2—27

263,641
WHEEL CHAIR POSITIONING HARNESS OR THE LIKE
Rutger Nandorf, S-593 00 Västervik, Sweden
Filed Dec. 11, 1979, Ser. No. 102,631
Claims priority, application Sweden, Nov. 6, 1979, 79-1436
Term of patent 3½ years
Int. Cl. D2—*02*
U.S. Cl. D2—27

263,642
OVERSHOE
Shirley M. Colley, 410 Briar Ave., Ottawa, Canada (K1H 5H6)
Filed May 17, 1979, Ser. No. 39,764
Claims priority, application Canada, Mar. 15, 1979, 15-03-79-1
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—271

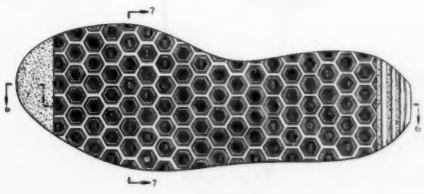


263,643
SHOE
Christian Vermonet, Cholet, France, assignor to Societe Technisynthese (S.A.R.L.), Saint Pierre, France
Filed May 6, 1980, Ser. No. 147,321
Term of patent 7 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



263,644
INNERSOLE
Keith E. Vinnecour, Van Nuys, Calif., and Richard B. Schwartz, Woodcliff Lake, N.J., assignors to Apex Foot Products Corp., Englewood, N.J.
Filed Feb. 22, 1980, Ser. No. 123,843
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—318

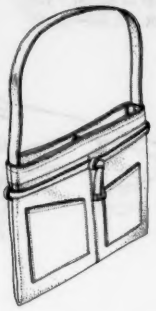
263,645
SOLE FOR A SHOE
Robert J. Mastrantuone, Waterbury, Conn., assignor to The Keds Corporation, Cambridge, Mass.
Filed Mar. 21, 1980, Ser. No. 133,482
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



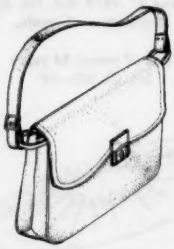
263,646
SHOE SOLE
Jeremy J. Railton, Los Angeles, Calif., assignor to Jungle Feet, Los Angeles, Calif.
Filed Apr. 21, 1980, Ser. No. 142,068
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321

263,647
SHOE SOLE
Jeremy J. Railton, Los Angeles, Calif., assignor to Jungle Feet, Los Angeles, Calif.
Filed Apr. 21, 1980, Ser. No. 142,070
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321

263,648
HANDBAG
Otto K. Schimmel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc., Tempe, Ariz.
Filed Mar. 24, 1980, Ser. No. 133,546
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—44

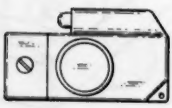


263,649
HANDBAG
Otto K. Schimmel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc., Tempe, Ariz.
Filed Mar. 24, 1980, Ser. No. 133,547
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—52

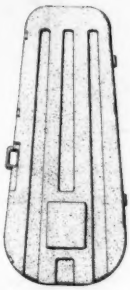


263,650
HANDBAG
Otto K. Schimmel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc., Tempe, Ariz.
Filed Mar. 24, 1980, Ser. No. 133,545
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—53

263,651
COMBINED KEY HOLDER AND LIGHT
Santino D. Meo, Oakland, Calif., assignor to Tri-Delta Industries, Inc., Hayward, Calif.
Continuation-in-part of Ser. No. 107,909, Dec. 28, 1979. This application Apr. 30, 1980, Ser. No. 141,296
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—63

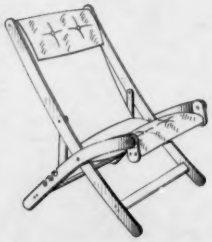


263,652
GUITAR CASE
Hartley D. Peavey, P.O. Box 2898, Meridian, Miss. 39301
Filed Mar. 25, 1980, Ser. No. 133,873
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—73

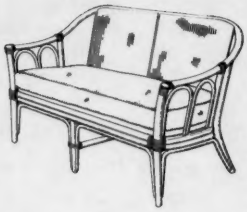


263,653
COMBINED CLOTHES TREE AND HEIGHT MEASURING UNIT
William Viets, 849 Barth La., Kettering, Ohio 45429
Filed May 19, 1980, Ser. No. 151,318
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—28

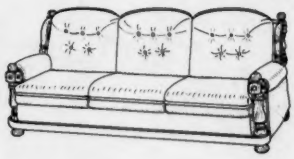
263,654
SLING CHAIR
Donald J. Borichevsky, Wells, Vt., assignor to The Telescope Folding Furniture Co., Inc., Granville, N.Y.
Filed Jun. 15, 1979, Ser. No. 48,835
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—41



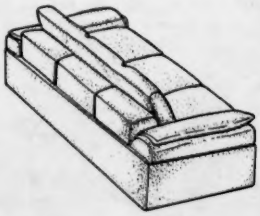
263,655
LOVESEAT
Mike T. Claman, New York, N.Y., assignor to Lewittes Furniture Enterprises, Inc., New York, N.Y.
Filed Jul. 19, 1979, Ser. No. 59,065
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—57



263,656
SEAT
David P. G. Williams, Englewood, N.J., assignor to The Bean Station Furniture Company, Bean Station, Tenn.
Filed Oct. 15, 1979, Ser. No. 85,224
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62

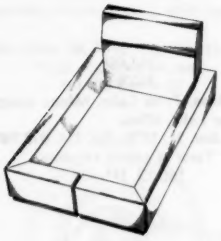


263,657
SOFA
Giorgia Saporiti, Besnate (Varese), Italy
Filed Apr. 30, 1979, Ser. No. 34,484
Claims priority, application Italy, Feb. 28, 1979, 60907 B/79
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

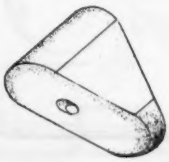


263,658
ARMCHAIR
Giorgia Saporiti, Besnate (Varese), Italy
Filed Apr. 30, 1979, Ser. No. 34,485
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

263,659
MATTRESS ENCLOSURE
Francine H. Cohen, and Arthur B. Cohen, both of 286 Redmond Rd., South Orange, N.J. 07079
Filed May 18, 1978, Ser. No. 907,068
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—83

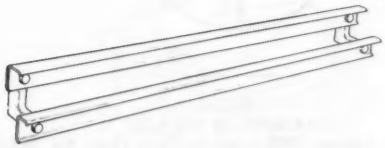


263,660
BATH SAFETY HANDLE
Andre Primault, Garches, France, assignor to Societe Generale de Fonderie, Paris, France
Filed Jan. 31, 1979, Ser. No. 8,036
Claims priority, application France, Aug. 2, 1978, 78-76776
Term of patent 14 years
Int. Cl. D23—*02;* D8—*06*
U.S. Cl. D6—86

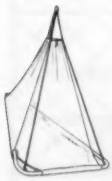


263,661
TOWEL RACK
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 13, 1980, Ser. No. 121,235
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99

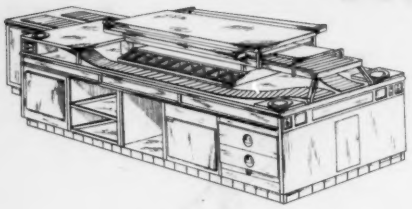
263,662
TOWEL RACK
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 22, 1980, Ser. No. 123,557
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99



263,663
HAMMOCK
Roger C. Moreau, 7 Galway Grove, Tranmere, South Australia, Australia
Filed May 11, 1979, Ser. No. 38,220
Claims priority, application Australia, Apr. 6, 1979, 77536
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—113

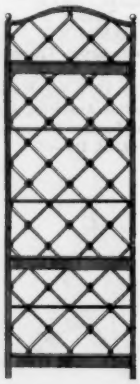


263,664
FAST FOOD SERVICE TABLE
Wayne C. Workman, 1002 Jarrett Cir., Ames, Iowa 50010
Filed Oct. 6, 1978, Ser. No. 949,106
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164

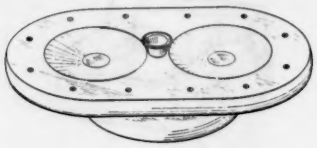


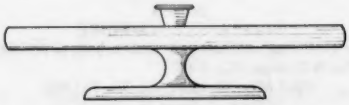
263,665
ROTATING MODULAR ALBUM HOLDER AND SUPPORTING BASE THEREFOR
Gerald R. Anderson, 2241 Donna Dr., Norman, Okla. 73069
Filed Jul. 17, 1978, Ser. No. 924,989
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185

263,666
ETAGERE OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Aug. 28, 1979, Ser. No. 70,437
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

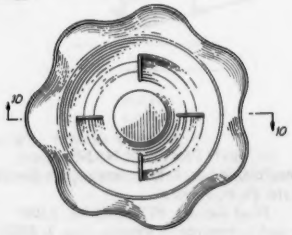


263,667
LIQUEUR SERVICE TRAY
Sidney Joseph E. Turcotte, Jr., 115 Main St. E., Hamilton, Ontario, Canada (L8N 1G5)
Filed Aug. 2, 1979, Ser. No. 63,065
Term of patent 14 years
Int. Cl. D7—*06, 99*
U.S. Cl. D7—22

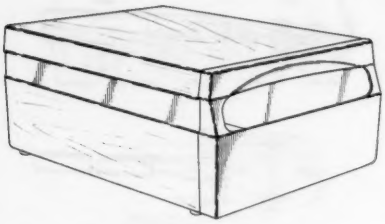




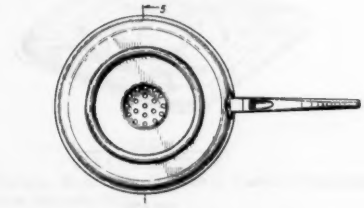
263,668
BOWL
Lawrence M. Knutson, Prior Lake, Minn., assignor to Decra-Stone, Inc., Prior Lake, Minn.
Filed Jan. 31, 1978, Ser. No. 873,965
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—29

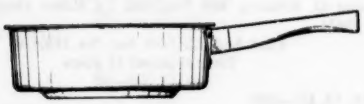


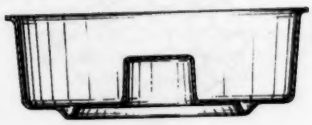
263,669
NAPKIN DISPENSER
Scott J. Collins, Brown Deer, Wis., assignor to Georgia-Pacific Corporation, Portland, Oreg.
Filed Jan. 11, 1980, Ser. No. 111,397
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—72



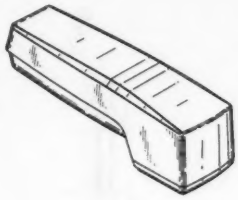
263,670
COOKING PAN
Albert C. Schawalder, Via Sorengo 2, 6900 Lugano-Besso, Switzerland
Filed Mar. 20, 1980, Ser. No. 132,361
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—95



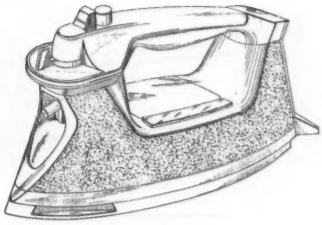




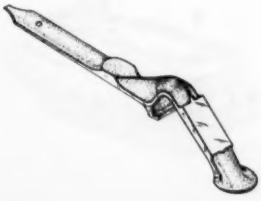
263,671
FOOD MIXER POWER UNIT
Ying H. Chan, Kowloon, Hong Kong, assignor to Starry Electric Manufactory Ltd., Hong Kong
Filed Nov. 1, 1979, Ser. No. 90,453
Claims priority, application United Kingdom, May 9, 1979, 989843
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—158



263,672
IRON OR SIMILAR ARTICLE
John C. Shalvoy, Fairfield, Conn., assignor to General Electric Company, New York, N.Y.
Filed Feb. 25, 1980, Ser. No. 124,424
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—70

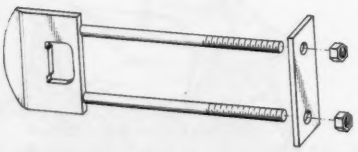


263,673
PRY TOOL FOR PLASTIC TUBS OR THE LIKE
John J. Sheehan, Carr Creek Rd., P.O. Box 38, Glencoe, Mo. 63038
Filed Feb. 21, 1980, Ser. No. 123,280
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—18

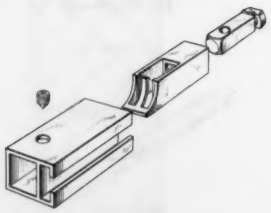


263,674
COMBINATION HYDRANT SPANNER AND LUG WRENCH
Karl Ebert, Giengen, Fed. Rep. of Germany, assignor to Max Widenmann Armaturenfabrik, Giengen, Fed. Rep. of Germany
Filed Feb. 12, 1979, Ser. No. 11,576
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—27

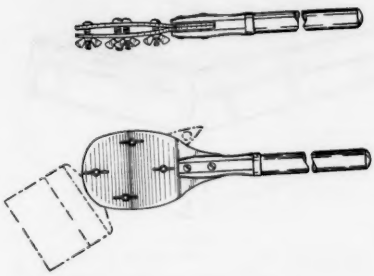
263,675
STRIKE PLATE
Steve P. Vorves, 6250 Lyons, Garland, Tex. 75043
Filed Mar. 19, 1979, Ser. No. 21,848
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—343



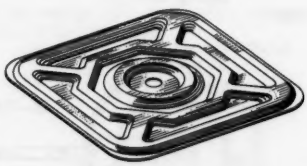
263,676
LOCK HOUSING WITH CONNECTING MECHANISMS
Olof B. Wahlin, Hinsholmsgatan 7, 421 77 Västra Frölunda, Sweden
Filed Oct. 29, 1979, Ser. No. 88,756
Claims priority, application Sweden, Apr. 27, 1979, 79-1090
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



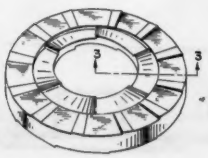
263,677
PAINT BRUSH EXTENSION CLAMP
Charles A. Clark, 764 N. Madison Ave., Los Angeles, Calif. 90029
Filed Dec. 11, 1978, Ser. No. 968,390
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—396



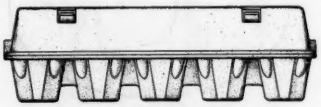
263,678
ROOF INSULATION WASHER
George G. Dewey, Prospect Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Nov. 7, 1979, Ser. No. 92,161
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—399



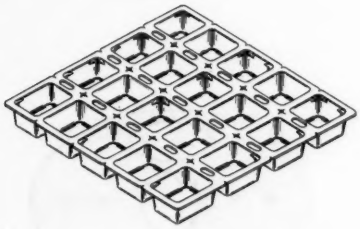
263,679
REVERSIBLE LOCK WASHER
Bengt O. Frieberg, 869 Picacho, La Habra Heights, Calif. 90631
Filed Aug. 22, 1980, Ser. No. 180,410
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—399



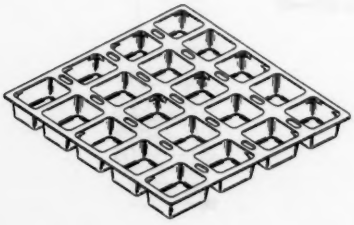
263,680
EGG CARTON
Jørgen Schrøder, Copenhagen, Denmark, assignor to Aktieselskabet Brødrene Hartmann, Lyngby, Denmark
Filed Jan. 30, 1979, Ser. No. 7,696
Claims priority, application Denmark, Aug. 1, 1978, 597/78
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341



263,681
JELLY CUP TRAY
Raymond A. Parr, Sunnyvale, Calif., assignor to Guardian Packaging Corporation, Newark, Calif.
Filed May 17, 1979, Ser. No. 39,816
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341



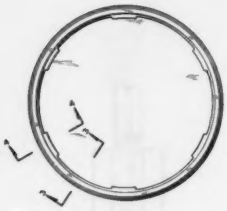
263,682
JELLY CUP TRAY
Henry R. Urciuoli, Brea, Calif., assignor to Guardian Packaging Corporation, Newark, Calif.
Filed May 17, 1979, Ser. No. 39,842
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341

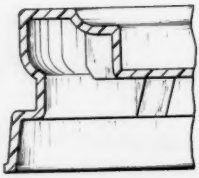


263,683
BOTTLE OR SIMILAR ARTICLE
Serge Mansau, Neuilly sur Seine, France, assignor to Lever Brothers Company, New York, N.Y.
Filed Jan. 28, 1980, Ser. No. 115,990
Claims priority, application United Kingdom, Aug. 28, 1979, 991332/79
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—400

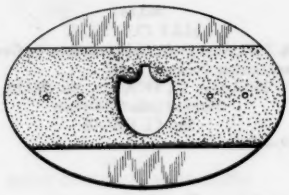
263,684
CONTAINER FOR FOOD OR THE LIKE
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Dec. 3, 1979, Ser. No. 99,595
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D9—426

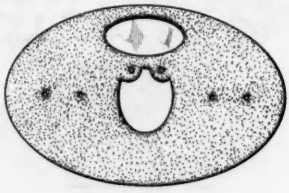
263,685
CLOSURE OR SIMILAR ARTICLE
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Continuation of Ser. No. 851,652, Nov. 15, 1977, abandoned, which is a division of Ser. No. 675,404, Apr. 9, 1976, Pat. No. 249,643, which is a continuation-in-part of Ser. No. 588,122, Jun. 18, 1975, abandoned. This application Aug. 2, 1979, Ser. No. 63,327
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—452





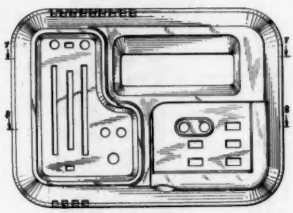
263,686
JEWELRY DISPLAY CARD
Bruce S. Jeremiah, 387 Charles St., Providence, R.I. 02904
Filed Dec. 31, 1979, Ser. No. 109,458
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—457





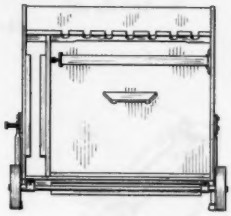
263,687
WRIST WATCH
Yutaka Fukumura, Murayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jun. 6, 1979, Ser. No. 47,826
Claims priority, application Japan, Jan. 22, 1979, 1439
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—39

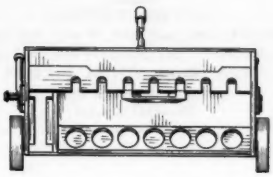
263,688
THERMOSTAT CASING
Joseph Bologna, Woodbury, N.Y.; William Blasnik, Demarest, N.J., and Philip Torbet, Port Washington, N.Y., assignors to Bogo Sales Co., W. Hempstead, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,401
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60



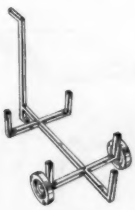
263,689
SEASHELL DISPLAY
Charles F. Moore, 3306 Beverly Rd., Baltimore, Md. 21214
Filed Jul. 18, 1979, Ser. No. 58,498
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—135

263,690
BASEBALL EQUIPMENT CART
Bernard C. Laub, Tulsa, Okla., assignor to Hugh J. Finnerty, Tulsa, Okla.
Filed Feb. 22, 1979, Ser. No. 13,882
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24

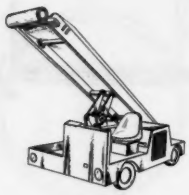




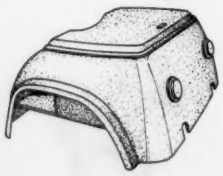
263,691
CART
W. Lynn Streiff, 3230 Inspiration Dr., Colorado Springs, Colo. 80917
Filed Mar. 22, 1979, Ser. No. 22,713
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—26



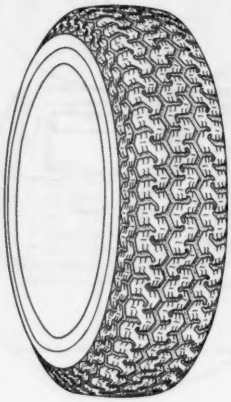
263,692
BELT LOADER
Walter W. Conrad, Torrance, Calif., assignor to W W Industries, Inc., Hawthorne, Calif.
Filed Dec. 10, 1979, Ser. No. 102,143
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—29



263,693
THREE WHEEL MOTORCYCLE BODY
James S. Kaiser, Rte. #3 Crawford Dr., Proctorville, Ohio 45669; John D. Vincent, 585 McCutcheon, Columbus, Ohio 43230; Roger C. Vincent, 128 Cleveland Ave., Milford, Ohio 45150, and Ricky L. Davie, Orient, Ohio, assignors to James Stewart Kaiser, Proctorville; John Denny Vincent, Columbus and Roger C. Vincent, Milford, all of, Ohio
Filed Nov. 7, 1979, Ser. No. 92,201
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



263,694
TIRE
Gernot Arendt, Tribuswinkel, Austria, assignor to Semperit Aktiengesellschaft, Vienna, Austria
Filed Jun. 11, 1979, Ser. No. 47,494
Claims priority, application Austria, Dec. 21, 1978, 514972
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



263,695
ANTENNA MOUNTING DEVICE
Russell A. Reber, 244 Neptune Ave., Beachwood, N.J. 08722
Filed Jan. 25, 1979, Ser. No. 6,315
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—155

263,696

SPLASH GUARD FOR MOUNTING BEHIND A VEHICLE WHEEL

Ingemar Regler, Stocksund, Sweden, assignor to Safety Vehicles Development A.B., Stocksund, Sweden

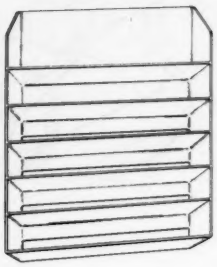
Filed Apr. 2, 1979, Ser. No. 26,350

Claims priority, application Sweden, Oct. 2, 1978, 782258

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—185



263,697

RUNNING BOARD

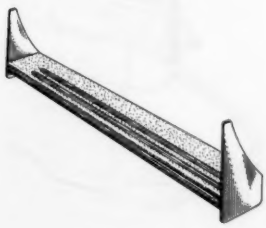
Thomas J. Mathews, 206 S. Locust, Canby, Oreg. 97013

Filed Oct. 15, 1979, Ser. No. 84,818

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—203



263,698

SLEEVE FOR MARKING ELECTRICAL WIRES AND CABLES

Göran Lööf, Gullspang, and Lars Skarin, Otterbäcken, both of Sweden, assignors to Partex Fabriksaktiebolag, Gullspang, Sweden

Filed Mar. 29, 1979, Ser. No. 25,154

Claims priority, application Sweden, Sep. 29, 1978, 78-2242

Term of patent 14 years

Int. Cl. D13—*99*

U.S. Cl. D13—13

263,699

POWER CORD PLUG

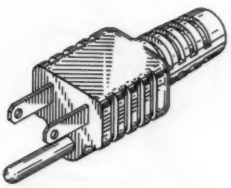
Gary W. Vest, and John W. Marcuse, both of Cleveland, Ohio, assignors to New Era Products, Inc., Cleveland, Ohio

Filed Aug. 24, 1979, Ser. No. 69,273

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—28



263,700

CASSETTE DECK

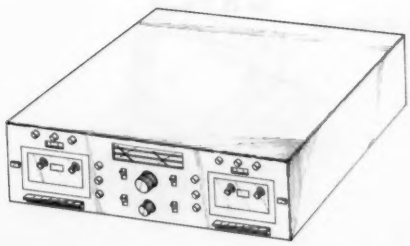
Warren B. Kice, Potomac, Md.

Filed Aug. 22, 1980, Ser. No. 181,642

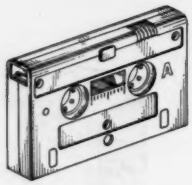
Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—6

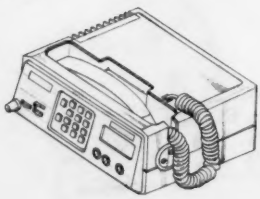


263,701
TAPE CARTRIDGE
Kaoru Morita, Yokohama, Japan, assignor to Echo Sonic Co., Ltd., Tokyo, Japan
Filed Feb. 5, 1980, Ser. No. 118,825
Claims priority, application Japan, Oct. 3, 1979, 54-04172
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11

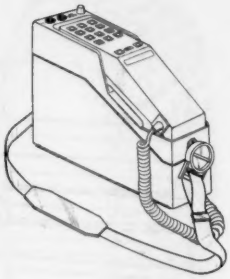


263,702
VEHICULAR TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 5, 1979, Ser. No. 54,839
Claims priority, application Japan, Jan. 25, 1979, 54-002012
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

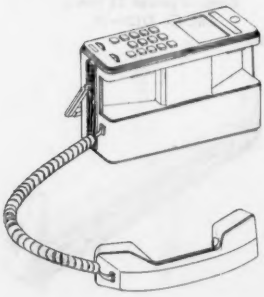
263,703
PORTABLE WIRELESS TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 4, 1979, Ser. No. 72,132
Claims priority, application Japan, Apr. 12, 1979, 54-014470
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



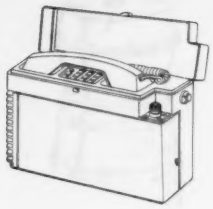
263,704
PORTABLE WIRELESS TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 4, 1979, Ser. No. 72,356
Claims priority, application Japan, Apr. 12, 1979, 54-014471
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

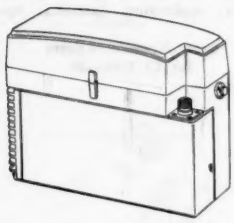


263,705
PORTABLE WIRELESS TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 4, 1979, Ser. No. 72,357
Claims priority, application Japan, Apr. 12, 1979, 54-014473
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



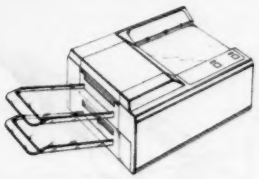
263,706
PORTABLE WIRELESS TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 24, 1979, Ser. No. 78,176
Claims priority, application Japan, Apr. 13, 1979, 54-014624
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53





263,707
DIALING PAD
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Nov. 16, 1979, Ser. No. 95,525
Claims priority, application Japan, Jun. 13, 1979, 54-024163
Term of patent 14 years
Int. Cl. D14—*02, 03;* D18—*01*
U.S. Cl. D14—66

263,708
FACSIMILE RECORDER AND TRANSCEIVER
Nobuki Matsumoto; Manzo Yoshihama, both of Yokohama, and Fumiyo Kojima, Hiratsuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jun. 4, 1980, Ser. No. 156,637
Claims priority, application Japan, Dec. 6, 1979, 54-51018
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D14—94

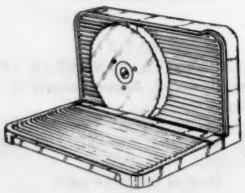


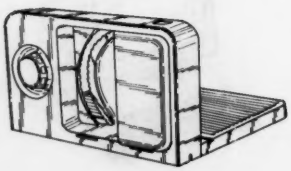
263,709
TRANSMITTER
Shoichi Ando, 3-3, 1-chome, Nakameguro, Meguro-ku, Tokyo, Japan
Filed Jul. 12, 1979, Ser. No. 57,035
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—95

263,710
DISPLAY APPARATUS OR SIMILAR ARTICLE
Masakatsu Asano, Kawasaki, Japan, assignor to The General Corporation, Japan
Filed Feb. 13, 1980, Ser. No. 121,107
Claims priority, application Japan, Nov. 2, 1979, 54-46228; Dec. 20, 1979, 54-53596
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106

263,711
FUEL INJECTION NOZZLE
Dennis N. Dean, Fremont, Calif., assignor to Norman L. Modesett, Fremont, Calif.
Filed Dec. 31, 1979, Ser. No. 108,416
Term of patent 3½ years
Int. Cl. D15—*01*
U.S. Cl. D15—5

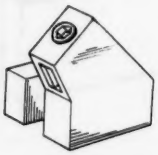
263,712
FOLDABLE SLICING MACHINE
Edgar Rixen, Solingen, Fed. Rep. of Germany, assignor to Firma Robert Krups, Solingen, Fed. Rep. of Germany
Filed Aug. 2, 1978, Ser. No. 930,545
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 58876
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—97





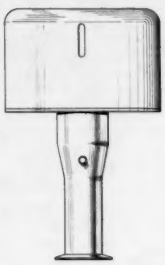
263,713
VIBRATORY TUMBLER
William F. Baer, 1509 N. Darcy, Simi Valley, Calif. 93065
Filed Sep. 21, 1979, Ser. No. 77,637
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—124

263,714
LATHE TOOL HOLDER
Howard A. Treloar, P.O. Box 86, Clarence Gardens, Australia (5039)
Filed Oct. 17, 1979, Ser. No. 85,516
Claims priority, application Australia, Apr. 23, 1979, 77675/79
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140

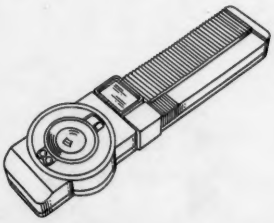


263,715
FUNNEL
Leonard J. Walter, 823 W. 187th St., Homewood, Ill. 60430
Filed Mar. 4, 1980, Ser. No. 127,225
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199

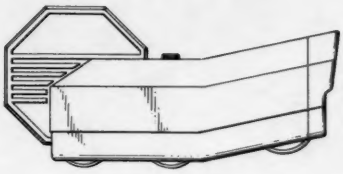
263,716
PANORAMIC CAMERA
Ronald P. Globus; Richard D. Globus, and Stephen E. Globus, all of New York, N.Y., assignors to Globuscope, Inc., New York, N.Y.
Filed Feb. 6, 1979, Ser. No. 9,809
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



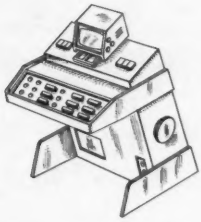
263,717
PHOTOGRAPHIC CAMERA
Norbert Schlagheck; Herbert Schultes, both of Fuerstenfeldbruck, and Karlheinz Rubner, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Dec. 10, 1979, Ser. No. 102,319
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 5MR 559-G 163/79-4
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



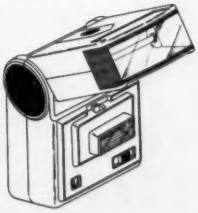
263,718
COMBINED VIEWER AND PROJECTOR
Wong Ming, Kowloon, Hong Kong, assignor to Desport Limited, Hong Kong, Hong Kong
Filed Aug. 9, 1979, Ser. No. 65,386
Claims priority, application United Kingdom, Feb. 16, 1979, 988595/79
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—19



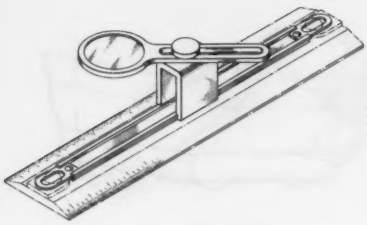
263,719
PHOTO VIDEO ANALYZER AND PRINTER OR SIMILAR ARTICLE
Robert D. McConnell, 180 Partridge Rd., Pittsfield, Mass. 01201
Filed Feb. 28, 1980, Ser. No. 125,378
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—28



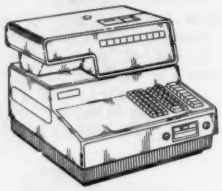
263,720
ELECTRIC FLASH DEVICE FOR CAMERA
Yoshiyuki Takematsu, 38-1 Komaba 1 Chome, Meguro-ku Tokyo, Japan
Filed Jun. 12, 1979, Ser. No. 47,704
Claims priority, application Japan, Dec. 17, 1978, 53-053137
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



263,721
DRAFTING MACHINE SCALE MAGNIFIER ATTACHMENT
Michael L. Miller, Pasadena, Calif., assignor to Vemco Corporation, Pasadena, Calif.
Filed Apr. 4, 1980, Ser. No. 137,262
Term of patent 14 years
Int. Cl.[3] D16—*06*
U.S. Cl. D16—135

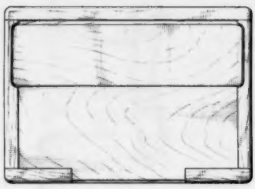


263,722
CASH REGISTER HOUSING
Anthony Maladra, Moorestown; Adolf Frohlking, Willingboro, and George Horton, Englewood, all of N.J., assignors to Comtrex Systems Corporation, Mt. Laurel, N.J.
Filed Jul. 17, 1980, Ser. No. 169,891
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—4



263,723
CASH REGISTER HOUSING
Anthony Maladra, Moorestown; Adolf Frohlking, Willingboro, and George Horton, Englewood, all of N.J., assignors to Comtrex Systems Corporation, Mt. Laurel, N.J.
Filed Jul. 17, 1980, Ser. No. 169,892
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—4

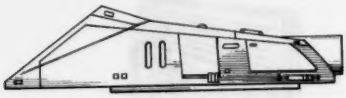
263,724
COMBINED PAPER TRAY AND PAPERWEIGHT
Clayton A. Laughlin, Minneapolis, Minn., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Jul. 25, 1979, Ser. No. 60,523
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



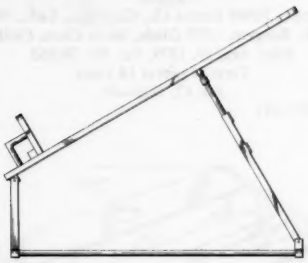
263,725
TABLE TOP GOLF GAME BOARD
Mark A. Booth, 4127 Maple St., Omaha, Nebr. 68111
Filed Feb. 21, 1979, Ser. No. 13,754
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27

263,726
PLAYING SPINNING DISC INDICATOR
Viktor Andersson, Ringtofta, Postlada, 2552 S-243 00, Höör, Sweden
Filed Oct. 30, 1979, Ser. No. 89,313
Claims priority, application Sweden, Jun. 6, 1979, 791401
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—39

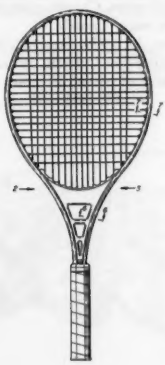
263,727
TOY SPACESHIP
Andrew G. Probert, El Segundo, Calif., assignor to Paramount Pictures Corporation, Los Angeles, Calif.
Filed May 7, 1979, Ser. No. 36,534
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—87



263,728
ADJUSTABLE EXERCISE BENCH
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Dec. 4, 1979, Ser. No. 100,154
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

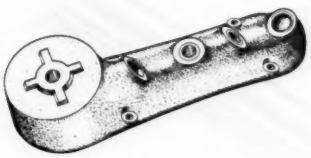


263,729
TENNIS RACKET
Charles M. Bash, Roosevelt, N.J., assignor to Prince Manufacturing, Princeton, N.J.
Filed Jun. 13, 1979, Ser. No. 48,552
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212

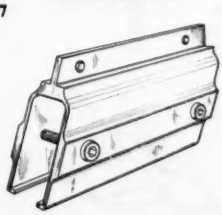


263,730
CONNECTOR BRACKET FOR A COLLAPSIBLE TENT FRAME
Edwin H. Oribin, 103 Elfin Rd., Launceston, Tasmania, Australia, assignor to Edwin Henry Oribin and Joyce Isobel Oribin, both of Victoria, Australia
Filed Jan. 28, 1980, Ser. No. 115,722
Claims priority, application Australia, Aug. 8, 1979, 78625/79
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—254

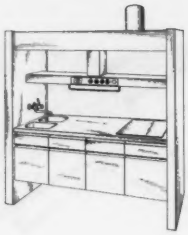
263,731
ROLLER SKATE PLATE
William Shepherd, Elizabeth, Australia, assignor to Youth Enterprises Trading Services Pty. Ltd., Elizabeth, Australia
Filed Nov. 29, 1979, Ser. No. 98,676
Claims priority, application Australia, Oct. 5, 1979, 79182/79
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226



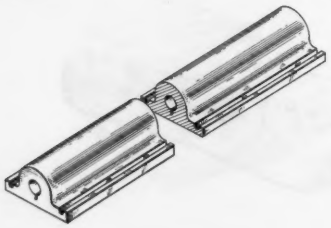
263,732
RIFLE TELESCOPE MOUNT
Daniel L. Bechtel, P.O. Box 11281, Fort Worth, Tex. 76109
Filed Apr. 18, 1980, Ser. No. 141,690
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7



263,733
KITCHEN MODULE
Leonardus J. F. Van Schayik, Bosweg 160 C, Oisterwijk, Netherlands
Filed Sep. 15, 1978, Ser. No. 942,676
Claims priority, application Switzerland, May 10, 1978, 109826/78
Term of patent 14 years
Int. Cl. D23—*02;* D06—*04*
U.S. Cl. D23—50



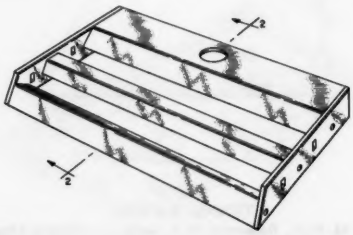
263,734
METAL EXTRUSION FOR AN ELECTRIC HEATING ELEMENT
Donald M. Cunningham; Richard W. Brent, both of Pittsburgh, and John C. Stover, Verona, all of Pa., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Mar. 24, 1980, Ser. No. 132,790
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—77



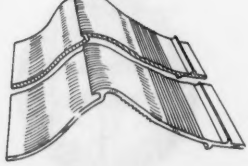
263,735
STOVEPIPE ADAPTOR FOR A FIREPLACE DAMPER
Stanley M. Oskwarek, Johnson Rd., Kent, Conn. 06757
Filed Oct. 29, 1979, Ser. No. 89,198
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127

263,736
FRONT PANEL FOR AN AIR CONDITIONING UNIT
Walter W. Hoyle, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 3, 1979, Ser. No. 63,627
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—141

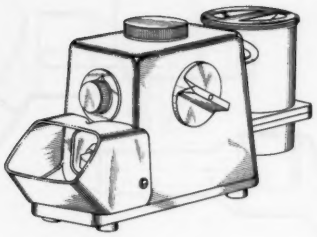
263,737
VENTILATING HOOD FOR AN ELECTROPLATING TANK
Steve A. Acero, 21089 Lavine Ct., Cupertino, Calif. 95014, and Edward L. Rougeau, 2592 Glade, Santa Clara, Calif. 95051
Filed Aug. 29, 1979, Ser. No. 70,853
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151



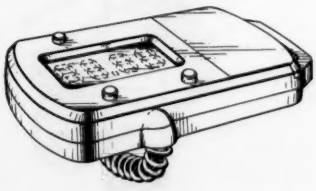
263,738
MIST ELIMINATOR BLADE FOR AIR HANDLING SYSTEMS
Richard Sixsmith, Burlington, Canada, assignor to Precisioneering Limited, Scarborough, Canada
Filed Sep. 17, 1979, Ser. No. 76,331
Claims priority, application Canada, Jun. 5, 1979, 05-06-79-8
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



263,739
AMALGAMATOR
Meyer Piet, Arcadia, and Dean G. Giles, Valinda, both of Calif., assignors to Futurecraft Corporation, City of Industry, Calif.
Filed Jan. 22, 1979, Ser. No. 5,558
Term of patent 14 years
Int. Cl. D24—*02*; D15—*09*
U.S. Cl. D24—10

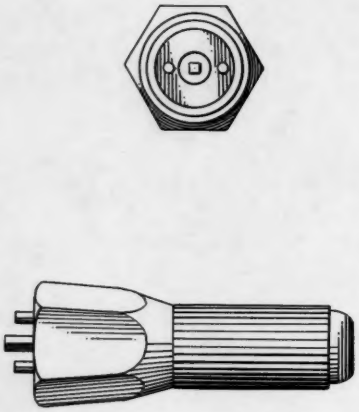


263,740
MINIATURE CARDIOTACHOMETER OR THE LIKE
Robert K. Rogers; Robert R. Steuer, both of Salt Lake City, Utah; F. Gordon Mackay, Tarzana; Spencer L. Mackay, Canoga Park, both of Calif., and Robert H. Horne, Holladay, Utah, assignors to Multitronics Corporation, Salt Lake City, Utah
Filed May 30, 1979, Ser. No. 43,840
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

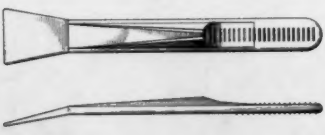


263,741
TEST DEVICE
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed May 9, 1979, Ser. No. 37,298
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21

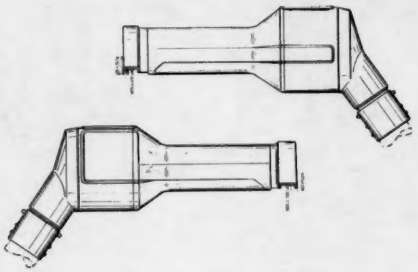
263,742
DENTAL HANDPIECE WRENCH
Thomas W. Albert, Bartlett, Ill., assignor to American Hospital Supply Corp., Evanston, Ill.
Filed Jan. 3, 1980, Ser. No. 109,311
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12



263,743
TONGUE DEPRESSOR
Anthony Priestman, Orillia, Canada, assignor to Intra-Medical Pharmaceuticals Ltd., Orillia, Canada
Filed Oct. 21, 1980, Ser. No. 199,253
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—19



263,744
CAST CUTTER
Robert P. Straub, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Oct. 17, 1979, Ser. No. 86,204
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28

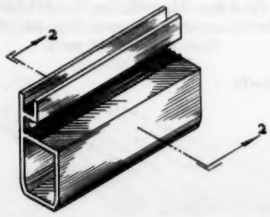


263,745
DESIGN FOR SURGICAL INSTRUMENT HOLDER
Dan Sandel, 19524 Halsted St., Northridge, Calif. 91324
Filed Oct. 29, 1979, Ser. No. 88,765
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—29

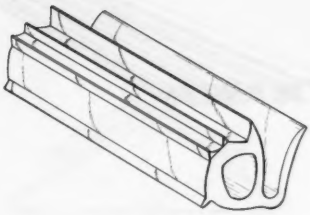
263,746
FLEXIBLE CONTAINER FOR MEDICAL LIQUIDS
Peter C. Johnson, Kenosha, Wis.; Ralph M. Quin, Jr., Ingleside, and John S. Ziegler, Arlington Heights, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 30, 1979, Ser. No. 71,144
Term of patent 14 years
Int. Cl. D24—*04;* D9—*01*
U.S. Cl. D24—58

263,747
NOSE STRAIGHTENER
Guillermo Jaramillo, and Maria E. Jaramillo, both of P.O. Box 160667, Miami, Fla. 33116
Filed Oct. 17, 1979, Ser. No. 85,730
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—64

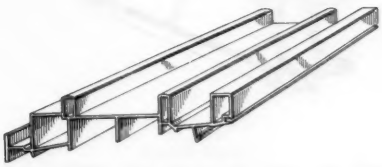
263,748
WINDOW COMPONENT EXTRUSION
Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024
Filed Oct. 22, 1979, Ser. No. 87,109
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



263,749
SUNROOF PANEL SEAL
Norman L. Sorensen, Detroit, Mich., assignor to Wisco Corporation, Livonia, Mich.
Filed Jan. 23, 1980, Ser. No. 114,607
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



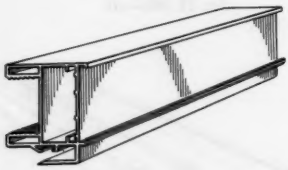
263,750
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,132
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



263,751
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,133
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

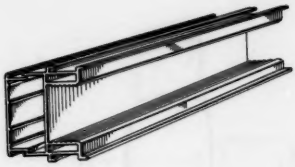
263,752
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,134
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

263,753
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,135
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

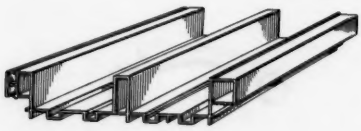


263,754
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,138
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

263,755
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,139
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



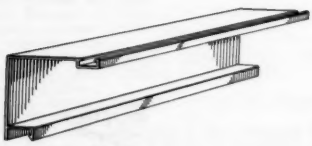
263,756
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,140
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



263,757
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 30, 1980, Ser. No. 145,258
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

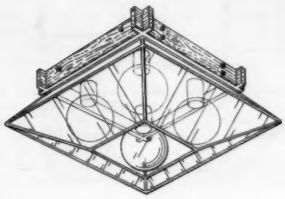
263,758
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, P. Q., Canada
Filed Apr. 30, 1980, Ser. No. 145,259
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

263,759
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, P. Q., Canada
Filed Apr. 30, 1980, Ser. No. 145,260
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

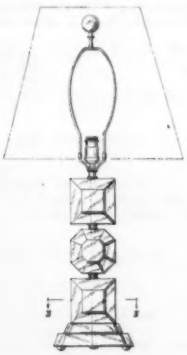


263,760
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, P. Q., Calif.X
Filed Apr. 30, 1980, Ser. No. 145,263
Claims priority, application France, Nov. 14, 1979, 78029
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

263,761
LIGHT FIXTURE
Fredrick R. Glassman, 16121 S. Carmenita Rd., Cerritos, Calif. 90701
Filed May 11, 1979, Ser. No. 38,369
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—83



263,762
LAMP BASE
Abraham Franzblau, 726 S. Davis Blvd., Tampa, Fla. 33606
Filed Aug. 7, 1979, Ser. No. 64,471
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93

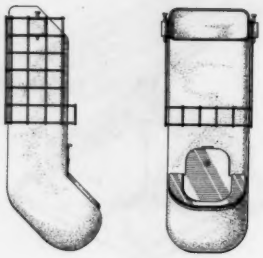


263,763

ANIMAL FEEDER

Bjarne J. Bore, N-4060 Kleppe, Norway

Filed Sep. 17, 1979, Ser. No. 76,274
Claims priority, application Norway, Mar. 16, 1979, 59975
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



263,764

ANIMAL IDENTIFICATION DISK AND THE LIKE

John P. McBride, II, 1365 McFarland Blvd., East, Tuscaloosa, Ala. 35405

Filed Oct. 29, 1979, Ser. No. 89,089
Term of patent 14 years
Int. Cl. D30—*08*
U.S. Cl. D30—43

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF APRIL, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Kamp, Eugene L.; Popeck, Charles A.; and Bruning, Armin M., 4,323,871, Cl. 337-7.000.

A/S Bruel & Kjaer: *See*—
Fauerskov, Svend E.; and Sjostrom, Svend O., 4,323,903, Cl. 346-32.000.

A-T-O Inc.: *See*—
Mitchell, Hal D., 4,322,859, Cl. 2-2.000.

Abbas, Shakir A.; and Magdo, Ingrid E., to International Business Machines Corporation. Self-aligned metal process for integrated injection logic integrated circuits. 4,322,883, Cl. 29-578.000.

Abbott Laboratories: *See*—
Ours, Carroll W.; and Lee, Cheuk M., 4,323,691, Cl. 560-36.000.

Abele, Manlio; Passalaqua, Anthony M.; and Chase, Norman E., to New York University. Ultrasound scanner. 4,322,974, Cl. 73-602.000.

Abell, Gurdon R.; Cook, Francis J.; and Howes, Peter D., to Avco Everett Research Laboratory, Inc. Method and apparatus for arraying image sensor modules. 4,323,925, Cl. 358-213.000.

Abrasive Developments Limited: *See*—
Arthur, Geoffrey C., 4,323,450, Cl. 210-11.00S.

Acerbi, Leo, to Oil Control S.r.l. Balanced valve with unidirectional oleo-dynamic unlocking, in particular to allow a number of hydraulic actuators to be series controlled at high pressure. 4,323,095, Cl. 137-87.000.

ACF Industries, Incorporated: *See*—
Dugge, Richard H.; and Rollins, Dallas W., 4,323,096, Cl. 137-350.000.

Achen, John J. Turntable for colorant dispensers. 4,323,097, Cl. 141-168.000.

Acher, Jacques: *See*—
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Colligon, Claude, 4,323,503, Cl. 260-340.300.

Acme Machine Company: *See*—
Carlson, Bertyl W., 4,323,034, Cl. 119-29.000.

Acro Matic, Inc.: *See*—
Terpening, George I., 4,323,232, Cl. 272-68.000.

Acrometal Products, Inc.: *See*—
Gerber, Dennis J., 4,322,919, Cl. 51-139.000.
Steinback, Clarence I., 4,322,918, Cl. 51-138.000.

Acushnet Company: *See*—
Keches, Leonidas A.; Goggin, Sharon R.; Isaac, Edward J.; and Rogers, Ronald J., 4,323,247, Cl. 273-235.00R.

Adair, James C: *See*—
Huckabee, Kermit D.; Adair, James C; and Worrell, Gene T., 4,323,989, Cl. 367-17.000.

Adams, Arthur C.; Alexander, Frank B., Jr.; Levinstein, Hyman J.; and Thibault, Louis R., to Bell Telephone Laboratories, Incorporated. Reducing charging effects in charged-particle-beam lithography. 4,323,638, Cl. 430-275.000.

Adams, Bevoley C. Structural connecting member. 4,323,319, Cl. 403-171.000.

Adams, Frank H. Combination breast pump and gavage feeding apparatus and method. 4,323,067, Cl. 128-281.000.

Adams, Frederick J.; and Downing, Philip A., to Cam Gears Limited. Variable ratio rack and pinion gear. 4,322,986, Cl. 74-89.180.

Adams, Thomas H.; Beck, James P.; and Menson, Robert C., to Baxter Travenol Laboratories, Inc. Novel particulate compositions. 4,323,478, Cl. 252-408.000.

Adsley, Ian: *See*—
Wykes, John S.; and Adsley, Ian, 4,323,778, Cl. 250-367.000.

Advanced Catheter Systems, Inc.: *See*—
Simpson, John B.; and Robert, Edward W., 4,323,071, Cl. 128-343.000.

Agencie Nationale de Valorisation de la Recherche (ANVAR): *See*—
Audibert, Francoise; and Lefrancier, Pierre, 4,323,559, Cl. 424-177.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Bergthaller, Peter; Himmelmann, Wolfgang; and Sobel, Johannes, 4,323,646, Cl. 430-622.000.
Kober, Heinrich; Nippe, Burkhard; and Seidel, Bernhard, 4,323,621, Cl. 428-216.000.

Aglietti, Giancarlo: *See*—
Canavesi, Roberto; Ligorati, Ferdinando; and Aglietti, Giancarlo, 4,323,716, Cl. 570-243.000.

Agusto, Robert G.: *See*—
Basa, Kenneth B.; and Agusto, Robert G., 4,323,583, Cl. 426-250.000.
Basa, Kenneth B.; and Agusto, Robert G., 4,323,587, Cl. 426-540.000.

Ahagon, Asahiro; Misawa, Makoto; Miyasaka, Kazuo; and Hirakawa, Hiroshi, to Yokohama Rubber Co., Ltd., The. Rubber compositions for tire treads having low rolling resistance. 4,323,485, Cl. 525-237.000.

Ahr, Nicholas A.; and Smith, Douglas J., to Procter & Gamble Company, The. Disposable absorbent article having an intermediate layer interposed between the topsheet and the absorbent core. 4,323,069, Cl. 128-287.000.

Ahrens, Robert O.; and Merkel, Jerry L., to McDonnell Douglas Corporation. Composite plastic structure and method for producing same. 4,323,623, Cl. 428-246.000.

Aisin Seiki Company, Limited: *See*—
Iwasaki, Shinichiro, 4,322,973, Cl. 73-517.00R.

Ajinomoto Co., Inc.: *See*—
Takami, Toru; Takezawa, Misako; Ohashi, Hiroyuki; and Takeda, Shigeru, 4,323,563, Cl. 424-199.000.

Akashi, Kazuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Cursor display control system for a raster scan type display system. 4,323,891, Cl. 340-709.000.

Akatsuka, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oxygen sensor with protective shield and porous air filter. 4,323,440, Cl. 204-195.00S.

Akebono Brake Industry Co., Ltd.: *See*—
Negishi, Akio, 4,323,143, Cl. 188-71.900.

Akimura, Yoshitaka: *See*—
Mifune, Hiroyuki; Hirano, Shigeo; and Akimura, Yoshitaka, 4,323,643, Cl. 430-441.000.

Akitomo, Nobuo; and Tohyama, Shigeo, to Hitachi, Ltd. Spectro-photometer with arithmetic and control unit. 4,323,309, Cl. 356-319.000.

Akzona Incorporated: *See*—
Zeilstra, Jacobus J.; de Klein, Willem J.; and Bik, Joannes D., 4,323,495, Cl. 524-156.000.

Albany International Corp.: *See*—
Gladh, Arne I. L.; and Grondahl, Eric W., 4,323,622, Cl. 428-230.000.

Albert, Richard D. Scanning radiographic method. 4,323,779, Cl. 250-401.000.

Albertus, Christian Gundorph: *See*—
Jacobsen, Leif V., 4,323,841, Cl. 324-51.000.

Alderson, John M. Liquid fuel preheating means. 4,323,043, Cl. 123-557.000.

Alekhin, Stanislav A.; Kuznetsov, Eduard B.; Bakhir, Vitold M.; Klimenko, Vladimir I.; and Zadorozhny, Jury G. Apparatus for electrokinetically separating drilling mud. 4,323,445, Cl. 204-300.00R.

Alexander, Frank B., Jr.: *See*—
Adams, Arthur C.; Alexander, Frank B., Jr.; Levinstein, Hyman J.; and Thibault, Louis R., 4,323,638, Cl. 430-275.000.

Alfa Romeo S.p.A.: *See*—
Radaelli, Dario; De Angelis, Giancarlo; and Catastini, Alberto, 4,323,976, Cl. 364-565.000.

Alfano, Vincent J. Control device and method for conserving fuel in an absorption refrigeration system. 4,322,951, Cl. 62-101.000.

Ali, Zaheer M., to Communications Satellite Corporation. Termination circuit for FDM/TDM processors. 4,324,000, Cl. 370-85.000.

Allec, Josiane: *See*—
Grollier, Jean-Francois; and Allec, Josiane, 4,323,468, Cl. 252-174.170.

Allee, Jimmy L., to Baker Service Company, Inc. Removable anti-wear insert. 4,323,131, Cl. 175-413.000.

Allen, Clayton H. Vibration damping method and means having non-contacting sound damping means. 4,323,145, Cl. 188-322.110.

Allied Corporation: *See*—
Bonfield, John H.; Belsky, Stephen E.; and Pickens, Donald, 4,323,706, Cl. 564-253.000.

Allis-Chalmers Corporation: *See*—
Stikeleather, Larry F.; and Totten, David S., 4,323,126, Cl. 172-147.000.

Allo, Vincent F.: *See*—
Stafford, Donald C.; and Allo, Vincent F., 4,323,115, Cl. 165-79.000.

Alps Electric Co., Ltd.: *See*—
Sugiura, Shigekata, 4,323,807, Cl. 312-284.000.

Alt, Rudolph, to General Tire & Rubber Company, The. Apparatus and method for forming dielectrically sealed laminar sheet materials. 4,323,409, Cl. 156-219.000.

American Beverage Control: *See*—
Shannon, Joseph W., 4,323,173, Cl. 222-136.000.

American Can Company: *See*—
Likins, Robert W., 4,323,748, Cl. 219-10.710.

American Hoechst Corporation: *See*—
Seeley, Douglas A., 4,323,307, Cl. 355-51.000.

American Home Products Corporation: *See*—
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, 4,323,572, Cl. 424-251.000.

Wolf, Milton; and Fenichel, Richard L., 4,323,681, Cl. 544-323.000.
American Standard Inc.: *See—*
Elder, J. Calvin, 4,323,210, Cl. 246-26.000.
Morris, Robert B.; and Clemmons, Quentin T., 4,323,144, Cl. 188-196.00A.
Ameron, Inc.: *See—*
Dana, William R.; Friedrich, Ralph S.; and McKenney, John D., 4,323,408, Cl. 156-175.000.
AMP Incorporated: *See—*
Kopp, Arthur R., 4,323,774, Cl. 250-214.00A.
AMSTED Industries Incorporated: *See—*
Radwill, Robert P., 4,322,981, Cl. 73-810.000.
Analog Devices, Incorporated: *See—*
Holloway, Peter R.; and Mercer, Douglas A., 4,323,795, Cl. 307-297.000.
Anchor Hocking Corporation: *See—*
Rubbright, Harry A.; and Springer, Donald A., 4,323,110, Cl. 165-2.000.
Andco Industries, Inc.: *See—*
Bruckenstein, Stanley, 4,323,462, Cl. 210-714.000.
Anderson, Willis H.: *See—*
Sheridan, John J.; Schwartz, Allen K.; and Anderson, Willis H., 4,323,744, Cl. 200-153.0LB.
Ando, Haruhisa: *See—*
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.
Andoh, Ikuhiro, to Fujitsu Limited. Connector. 4,323,296, Cl. 339-217.00S.
Andres, Jiri: *See—*
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.
Andrews, Ralph L., to Gulf & Western Manufacturing Company. Article transfer mechanism. 4,323,151, Cl. 198-740.000.
Anstis, Dorothy Isobel: *See—*
Anstis, Lawrence G., 4,322,997, Cl. 84-479.00A.
Anstis, Lawrence G., to Anstis, Dorothy Isobel, a part interest. Keyboard. 4,322,997, Cl. 84-479.00A.
Aoki, Kanemasa, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Miniature rotary electric machine. 4,323,806, Cl. 310-266.000.
Apt, Jerome, Jr.: *See—*
Lansberry, John B.; Apt, Jerome, Jr.; and Dury, Joseph D., Jr., 4,323,280, Cl. 299-1.000.
Apter, Robert; Philippi, John; Potichko, Nicholas; and Szablewski, Fred. C., to R. A. Industries. Piston metering pump. 4,323,333, Cl. 417-63.000.
Arai, Masatoshi: *See—*
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,323,488, Cl. 528-32.000.
Araki, Kenzi: *See—*
Nakaoka, Kazuhide; Araki, Kenzi; Iwase, Kozi; Kubotera, Haruo; Kurihara, Takao; and Tanaka, Nobuo, 4,323,403, Cl. 148-134.000.
Arenhold, Knut. Universal mudguard flap and clamp for motor vehicles. 4,323,262, Cl. 280-154.50R.
Armah, Ben: *See—*
Stenzel, Wolfgang; Fleck, Wolfgang; Cohnen, Erich; and Armah, Ben, 4,323,570, Cl. 424-251.000.
Arnold, Victor F.; and Dixon, Roger C., to Marconi Instruments Limited. Protection circuits. 4,323,943, Cl. 361-114.000.
Arseneau, Roger E., to Siemens Gammasonics, Inc. Non-uniformity energy correction method and apparatus. 4,323,977, Cl. 364-571.000.
Arthur, Geoffrey C., to Abrasive Developments Limited. Apparatus for separating a solid or viscous liquid component from a mixture. 4,323,450, Cl. 210-11.00S.
Arvey Corporation: *See—*
Gillie, Raymond A., 4,323,187, Cl. 229-34.00R.
Regenstein, Joseph, Jr., 4,323,189, Cl. 229-62.000.
Asahi Glass Company, Ltd.: *See—*
Itoi, Eiji; Nakayama, Takashi; Nakao, Makoto; and Matsumura, Yukio, 4,323,436, Cl. 204-98.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kawamura, Chikayuki; isoya, Toshiro; and Yamataka, Kazunori, 4,323,444, Cl. 204-269.000.
Yoshida, Mitsuo; Masuda, Yoshinori; and Kashiwada, Akio, 4,323,434, Cl. 204-98.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Enomoto, Shigeo, 4,323,303, Cl. 354-25.000.
ASEA Aktiebolag: *See—*
Moritz, Bertil; and Tonnesen, Ole, 4,323,870, Cl. 336-206.000.
Ashworth, Robert W.; and Fu, Wallace Y., to Union Carbide Corporation. Method for making thiobiscarbamates. 4,323,516, Cl. 260-453.300.
Asics Corporation: *See—*
Inohara, Masanobu, 4,322,891, Cl. 36-29.000.
Inohara, Masanobu, 4,322,892, Cl. 36-29.000.
Astec Components, Ltd.: *See—*
Josephson, Elliot, 4,323,961, Cl. 363-56.000.
Aston, Thomas M. Stabilizing vent system for gun barrels. 4,322,999, Cl. 89-14.00C.
Aston, William C.; and Walker, Derek, to Imi Yorkshire Imperial Plastics Limited. Manufacture of thermoplastics pipe. 4,323,535, Cl. 264-528.000.
Atalla, Anwar A.: *See—*
Swin, Richard E., Sr.; and Atalla, Anwar A., 4,323,330, Cl. 415-207.000.
Ateliers des Charmilles, S.A.: *See—*
Mazond, Michel P.; and Wavre, Alain, 4,323,749, Cl. 219-69.00M.
Atlantic Richfield Company: *See—*
DiGiulio, Adolph V.; and Bauer, Jack N., 4,323,655, Cl. 521-88.000.
Wakefield, G. Felix, 4,323,419, Cl. 156-622.000.
Atmospheric Energy Systems: *See—*
Ramlow, Bryan L.; and Steele, Richard R., 4,322,953, Cl. 62-217.000.
Audibert, Francoise; and Lefrancier, Pierre, to Agencie Nationale de Valorisation de la Recherche (ANVAR). Compounds derived from N-acetyl-nor-muramyl-L-alanyl-D-isoglutamic acid and other compounds and biologically active compositions containing such compounds. 4,323,559, Cl. 424-177.000.
Auerbach, Les M.; and Ricker, William F., to Old King Coal, Ltd. Coal-burning furnace or boiler. 4,323,051, Cl. 126-77.000.
Auergesellschaft GmbH: *See—*
Lemke, Andreas, 4,323,890, Cl. 340-524.000.
Avco Corporation: *See—*
Sellers, David J.; Rhodes, William H.; and Vasilos, Thomas, 4,323,545, Cl. 423-625.000.
Avco Everett Research Laboratory, Inc.: *See—*
Abell, Gurdon R.; Cook, Francis J.; and Howes, Peter D., 4,323,925, Cl. 358-213.000.
Averbuch, Joseph. Machine for cutting precious stones. 4,323,050, Cl. 125-30.00R.
Ayata, Naoki: *See—*
Fujii, Motoharu; Koumura, Noboru; Ayata, Naoki; Saito, Seiji; and Sato, Yasushi, 4,323,919, Cl. 358-75.000.
Aziz, Mohammed I., to Procter & Gamble Company, The. Diaper with embossed textile sheet. 4,323,068, Cl. 128-287.000.
B.V.S.: *See—*
Denoor, Gaston; and Thillet, Georges, 4,323,200, Cl. 242-7.210.
Baba, Takao: *See—*
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.
Bach, William D. Vine support for plants. 4,322,911, Cl. 47-45.000.
Baird Corporation: *See—*
Brennan, Thomas M., 4,323,298, Cl. 350-36.000.
Baji, Toru: *See—*
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.
Baker Service Company, Inc.: *See—*
Allee, Jimmy L., 4,323,131, Cl. 175-413.000.
Bakhir, Vitold M.: *See—*
Alekhin, Stanislav A.; Kuznetsov, Eduard B.; Bakhir, Vitold M.; Klimenko, Vladimir I.; and Zadorozhny, Jury G., 4,323,445, Cl. 204-300.00R.
Balash, Frederick A., to Rogers Corporation. Keyboard actuator device and keyboard incorporating the device. 4,323,740, Cl. 200-5.00A.
Baldwin, Nealy B. Energy saving exhaust siphon. 4,323,139, Cl. 181-263.000.
Balkhanova, Galina F.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.
Ball, Douglas C., to Hauserman Ltd. Desk or the like with wire management. 4,323,291, Cl. 312-194.000.
Ball, Frank C.; and Wardle, Edmund, to Hydro-Test, Inc. Gas pressure relieving hydrostatic tester. 4,322,969, Cl. 73-40.50R.
Ball, James, to British Aerospace. Folding fins. 4,323,208, Cl. 244-3.280.
Ball, Peter, to FMC Corporation. Articulated loading arm control system. 4,323,975, Cl. 364-559.000.
Ball, William J.; Palmer, Keith W.; and Stewart, David G., to British Petroleum Company Limited, The. Process for the production of amorphous aluminosilicates and their use as catalysts. 4,323,475, Cl. 252-373.000.
Balzer, Gerry C.; and Gordon, Alan M., to Bell Telephone Laboratories, Inc. Key telephone line shunt detector circuit. 4,323,735, Cl. 179-99.0LC.
Bambara, Joseph E.; and Sanville, W. Woodward, to Servo Corporation of America. Self adjusting wheel bearing heat signal processing circuit. 4,323,211, Cl. 246-169.00A.
Banba, Tosio: *See—*
Tsugekawa, Takanori; Banba, Tosio; and Matsui, Masakuni, 4,323,039, Cl. 123-275.000.
Bando, Niro; Miyata, Junji; Tone, Masatsugu; and Watanabe, Haruo, to Kubota, Ltd. Work vehicle. 4,323,137, Cl. 180-305.000.
Barber, Stanley. Dual fuel system for automobiles. 4,323,046, Cl. 123-575.000.
Barker, Andrew J.: *See—*
West, Robert N.; West, Patricia A.; Barker, Andrew J.; and Hall, Rosemary J., 4,323,311, Cl. 356-431.000.
Barnes, Richard M.; Vachula, George M.; and Bennett, Clarence L., Jr., to Sperry Corporation. Polarization detector. 4,323,898, Cl. 343-5.0SA.

Barnes, Richard M.; and Vachula, George M., to Sperry Corporation. Polarization detector. 4,323,899, Cl. 343-55.00A.

Basa, Kenneth B.; and Agusto, Robert G., to National Can Corporation. Colorants for lipid-based edible compositions and lipid-based compositions made therefrom. 4,323,583, Cl. 426-250.000.

Basa, Kenneth B.; and Agusto, Robert G., to National Can Corporation. Colorants for lipid-based edible compositions and lipid-based compositions made therefrom. 4,323,587, Cl. 426-540.000.

Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, to Ciba-Geigy Corporation. Novel phosphorylmuramyl peptides and processes for the manufacture thereof. 4,323,560, Cl. 424-177.000.

BASF Aktiengesellschaft: *See—*
Degen, Hans-Juergen; and Grychtol, Klaus, 4,323,362, Cl. 8-506.000.
Hoch, Helmut; and Hiller, Heinrich, 4,323,510, Cl. 260-367.000.
Vogel, Hans-Henning; Strickler, Rainer; Oppenlaender, Knut; and Baur, Richard, 4,323,689, Cl. 548-336.000.

BASF Wyandotte Corporation: *See—*
Schmolka, Irving R., 4,323,552, Cl. 424-54.000.

Baskins, Lowell L.; and Durham, Rodney M., to Infrared Industries, Inc. Hydrocarbon gas analyzer. 4,323,777, Cl. 250-339.000.

Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V. Catalyst for decomposition of 1,3-dioxanes. 4,323,479, Cl. 252-432.000.

Bateman, John M.: *See—*
Peters, Thomas E.; and Bateman, John M., 4,323,338, Cl. 425-174.80E.

Batham, Ian N. Magnetic contamination detector. 4,323,843, Cl. 324-204.000.

Baudry, Hugues; Morhaim, Claude; and Bricout, Dominique, to U.S. Philips Corporation. Starting mixture for a dielectric composition, screen printing paste having such a starting mixture, and product obtained. 4,323,652, Cl. 501-17.000.

Bauer, Jack N.: *See—*
DiGiulio, Adolph V.; and Bauer, Jack N., 4,323,655, Cl. 521-88.000.

Bauer, Kurt: *See—*
Glatt, Werner; and Bauer, Kurt, 4,323,312, Cl. 366-102.000.

Baum, Jonathan S., to FMC Corporation. Preparation of esters. 4,323,685, Cl. 546-300.000.

Baumann, Heinz; Kuehnel, Werner; and Rattner, Manfred, to Siemens Aktiengesellschaft. Tomographic X-ray diagnostic unit with the secondary of the high voltage transformer rotating with the X-ray source. 4,323,781, Cl. 250-422.000.

Baur, Richard: *See—*
Vogel, Hans-Henning; Strickler, Rainer; Oppenlaender, Knut; and Baur, Richard, 4,323,689, Cl. 548-336.000.

Baxter, Andrew J. G., to Beecham Group Limited. β-Lactam anti-bacterial, compositions containing them and a process for their preparation. 4,323,569, Cl. 424-251.000.

Baxter Travenol Laboratories, Inc.: *See—*
Adams, Thomas H.; Beck, James P.; and Menson, Robert C., 4,323,478, Cl. 252-408.000.
Kling, John E., 4,323,065, Cl. 128-214.00R.

Bayer Aktiengesellschaft: *See—*
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,323,596, Cl. 427-127.000.
Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,323,501, Cl. 260-333.000.
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,323,571, Cl. 424-251.000.
Mazanek, Jan; Gipp, Roland; Zollner, Robert; Seifert, Peter; Wagner, Kuuno; and Blahak, Johannes, 4,323,657, Cl. 521-116.000.
Merten, Rudolf; and Rottmaier, Ludwig, 4,323,687, Cl. 548-264.000.
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,323,670, Cl. 542-415.000.
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,323,671, Cl. 542-415.000.
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; and Walkowiak, Michael, 4,323,348, Cl. 433-228.000.
Schmitz-Josten, Robert; Dietrich, Manfred; and Bomer, Bruno, 4,323,696, Cl. 560-220.000.
Sesterhenn, Lothar; and Tomic, Milorad, 4,323,438, Cl. 204-128.000.

Bayliss, Colin R., to BCIRA. Knock-out systems for foundries. 4,323,106, Cl. 164-260.000.

BCIRA: *See—*
Bayliss, Colin R., 4,323,106, Cl. 164-260.000.

Beaman, Robert D. Amusement device formed of a plurality of differently shaped interfitting modular units. 4,323,245, Cl. 273-157.00R.

Beck, James P.: *See—*
Adams, Thomas H.; Beck, James P.; and Menson, Robert C., 4,323,478, Cl. 252-408.000.

Beckerman, Howard L.; and Dob, Allan M., to Singer Company, The. Instructional flip plate informational system. 4,323,023, Cl. 112-158.00F.

Beckley, Kenneth E. Directory assembly. 4,322,903, Cl. 40-489.000.

Beckwith Electric Co., Inc.: *See—*
Pettigrew, Robert D., 4,323,838, Cl. 323-256.000.

Beduchaud, Michel: *See—*
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,323,927, Cl. 358-296.000.

Beecham Group Limited: *See—*
Baxter, Andrew J. G., 4,323,569, Cl. 424-251.000.

Beers, Melvin D., to General Electric Company. Extreme low modulus RTV compositions. 4,323,489, Cl. 524-788.000.

Beiersdorf Aktiengesellschaft: *See—*
Stenzel, Wolfgang; Fleck, Wolfgang; Cohnen, Erich; and Armah, Ben, 4,323,570, Cl. 424-251.000.

Beitler, Franz; and Neckamm, Harald, to U.S. Philips Corporation. Recording and/or reproducing apparatus. 4,323,936, Cl. 360-85.000.

Belcher, Noble: *See—*
Ervin, Ron E.; and Belcher, Noble, 4,323,762, Cl. 219-482.000.

Belden Corporation: *See—*
Kincaid, John W.; and Ward, Robert E., 4,323,721, Cl. 174-36.000.

Belgorodsky, Izrail M.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., to Caterpillar Tractor Co. Bearing having an array of microasperities. 4,323,401, Cl. 148-39.000.

Bell Telephone Laboratories, Incorporated: *See—*
Adams, Arthur C.; Alexander, Frank B., Jr.; Levinstein, Hyman J.; and Thibault, Louis R., 4,323,638, Cl. 430-275.000.
Balzer, Gerry C.; and Gordon, Alan M., 4,323,735, Cl. 179-99.0LC.
Campbell, Joe C.; and Lee, Tien P., 4,323,911, Cl. 357-30.000.
Carriere, Joseph F.; Gaunt, Wilmer B., Jr.; Landry, Joseph E.; and Spires, Dewayne A., 4,323,885, Cl. 340-347.0CC.
Dickey, Larry W., 4,323,206, Cl. 242-129.600.
Embree, Milton L.; and Garrett, William G., 4,323,797, Cl. 307-490.000.
Hartman, Adrian R.; Scott, Robert S.; and Shackle, Peter W., 4,323,942, Cl. 361-56.000.
King, William C.; and Knight, Stephen, 4,323,799, Cl. 307-571.000.
Klein, Theodore H., 4,323,421, Cl. 156-630.000.
Ott, Henry W.; and Tilson, Bernard A., 4,323,733, Cl. 179-6.30R.

Belsky, Stephen E.: *See—*
Bonfield, John H.; Belsky, Stephen E.; and Pickens, Donald, 4,323,706, Cl. 564-253.000.

Belsterling, Charles A.; and Stone, John, to Franklin Institute, The. DC Motor control using motor-generator set with controlled generator field. 4,323,830, Cl. 318-158.000.

Belyaev, Valentin M.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Bendell, Sidney L., to RCA Corporation. Optical assembly for color television. 4,323,918, Cl. 358-50.000.

Bendix Corporation, The: *See—*
Sell, Robert C.; Sheler, John R.; and Juhasz, John M., 4,322,977, Cl. 73-701.000.
Whiteside, Arliss E.; Freedman, Morris D.; Tasar, Omur; and Rothschild, Alexander M., 4,323,966, Cl. 364-200.000.

Benelli Armi S.p.A: *See—*
Civolani, Bruno, 4,322,906, Cl. 42-70.00E.

Benguerel, Francois, to Sandoz Ltd. Carbocyclic disazo compounds containing a 2-amino-8-hydroxy-5- or 6-sulfo-naphthalene-2 coupling component radical. 4,323,498, Cl. 260-187.000.

Benjamin, Milton L.; Miles, Wilbur N.; and Ecker, Samuel, to Erikson Tool Company. Device for setting end working tools of multiple spindle automatic bar machines. 4,322,990, Cl. 82-3.000.

Benner Ski KG: *See—*
Benner, Wolfgang, 4,323,265, Cl. 280-604.000.

Benner, Timothy E.; and Month, Alfred, to RCA Corporation. Mesh assembly having reduced microphonics for a pick-up tube. 4,323,814, Cl. 313-390.000.

Benner, Wolfgang, to Benner Ski KG. Cross country ski. 4,323,265, Cl. 280-604.000.

Bennett, Clarence L., Jr.: *See—*
Barnes, Richard M.; Vachula, George M.; and Bennett, Clarence L., Jr., 4,323,898, Cl. 343-5.0SA.

Bentz, Rolf; and Fattinger, Volker, to Ciba-Geigy Corporation. Process for recovering nitrobenzene, dichlorobenzene and/or trichlorobenzene from exhaust gases, in particular spent air. 4,323,372, Cl. 55-59.000.

Bercha, Frank G.: *See—*
O'Rourke, J. Cam; Pilkington, G. Roger; and Bercha, Frank G., 4,323,322, Cl. 405-217.000.

Berdan, Betty L.; and King, William M., to Gould Inc. Metal composites and laminates formed therefrom. 4,323,632, Cl. 428-626.000.

Beretta, Paolo, to Minnesota Mining and Manufacturing Company. UV-Absorbing compounds and photographic elements containing them. 4,323,633, Cl. 430-17.000.

Berg, Arthur H., to Crouse-Hinds Company. Cable strain relief and sealing apparatus. 4,323,727, Cl. 174-135.000.

Berger, Jean L.; and Coutures, Jean L., to Thomson-CSF. Substraction and charge quantity generation charge transfer device. 4,323,791, Cl. 307-221.00D.

Berger, Sol J. Hang-up fixture. 4,323,215, Cl. 248-544.000.

Berggren, Benny, to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm. Method and apparatus for effecting by microwaves a substantially uniform heating of a material in a cavity. 4,323,745, Cl. 219-10.55A.

Bergman, Ola; Hagen, Rolf; Harenberg, Juergen; and Steiner, Herbert, to Siemens Aktiengesellschaft. Conversion circuit arrangement and method for switching digital encoded signals. 4,323,728, Cl. 178-3.000.

Bergmann, Conrad E. Apparatus for controlling and preventing oil blowouts. 4,323,118, Cl. 166-96.000.

Bergmann, Gunther; and Kessler, Arthur. Two terminal circuitry for voltage limitation. 4,323,792, Cl. 307-549.000.

Bergthaller, Peter; Himmelmann, Wolfgang; and Sobel, Johannes, to AGFA-Gevaert Aktiengesellschaft. Process for hardening a photographic material. 4,323,646, Cl. 430-622.000.

Berman, Joel; and Weinreich, Stephen D., to Berman, Joel. Window shade roller assembly. 4,323,105, Cl. 160-309.000.

Bernard, Walter J., to Sprague Electric Company. Electrolytic capacitor with high-purity aluminized cathode. 4,323,950, Cl. 361-433.000.

Berndlmaier, Erich; Clark, Bernard T.; and Dorler, Jack A., to International Business Machines Corporation. Heat transfer structure for integrated circuit package. 4,323,914, Cl. 357-82.000.

Bernhard, Horst, to Merck Patent Gesellschaft mit beschrankter Haftung. Preparation and use of improved pearlescent pigments of high light fastness. 4,323,554, Cl. 424-63.000.

Bertin, Jacques, to Hutchinson-Mapa. Seals of the type designed to ensure fluid-tightness between two rings of conical bearings. 4,323,254, Cl. 277-40.000.

Bessette, Norman F., to Bird Machine Company, Inc. Centrifuge bowl end attachment flanges. 4,323,190, Cl. 233-46.000.

Bessone, Carlo S.: *See—*
Roche, William J.; and Bessone, Carlo S., 4,323,824, Cl. 315-289.000.

Beu, Richard A., to Teledyne Hanau, a division of Teledyne, Inc. Dental articulator. 4,323,346, Cl. 433-58.000.

Beuthling, Gary J.: *See—*
Beuthling, Irvin C., 4,322,862, Cl. 6-5.000.

Beuthling, Irvin C., to Beuthling, Gary J.; and Miller, John A., a part interest. Apparatus and method for feeding bees. 4,322,862, Cl. 6-5.000.

Bickford, John H., to Raymond Engineering Inc.. Calibration test stand and method for hydraulic wrenches. 4,322,965, Cl. 73-1.00C.

Bik, Joannes D.: *See—*
Zeilstra, Jacobus J.; de Klein, Willem J.; and Bik, Joannes D., 4,323,495, Cl. 524-156.000.

Billett, Ronald J.: *See—*
Harper, Bruce M.; Billett, Ronald J.; Roberts, Thomas E.; and Viitanen, Veikko K., 4,323,336, Cl. 425-126.00S.

Bird Machine Company, Inc.: *See—*
Bessette, Norman F., 4,323,190, Cl. 233-46.000.

Birkelbach, Donald F.: *See—*
Lowery, Kirby, Jr.; Birkelbach, Donald F.; and Shipley, Randall S., 4,323,665, Cl. 526-122.000.

Bittar, Joseph, to Otis Elevator Company. Dynamically reevaluated elevator call assignments. 4,323,142, Cl. 187-29.00R.

Blahak, Johannes: *See—*
Mazanek, Jan; Gipp, Roland; Zollner, Robert; Seifert, Peter; Wagner, Kuuno; and Blahak, Johannes, 4,323,657, Cl. 521-116.000.

Blanchard, Clarence E., to Outboard Marine Corporation. Two-speed automatic transmission for a marine propulsion device. 4,323,354, Cl. 440-75.000.

Bleckmann, Hugo; and Kellerwessel, to Klockner-Humboldt-Deutz AG. Method for compressing and agglomerating coal dust. 4,323,532, Cl. 264-118.000.

Bloch, Bertrand; Meyer, Chantal C.; and Charrier, Denis, to Office National d'Etudes et de Recherches. Process for making an acrylic monomer. 4,323,695, Cl. 560-145.000.

Blocki, Roman, to Wytwornia Silnikow Wysokopreznych "PZL-Andrychow". Protecting an internal combustion fuel injection engine from overspeeding. 4,323,040, Cl. 123-389.000.

Blount, David H. Process for the production of cellulose-silicate products. 4,323,494, Cl. 524-858.000.

Bocca, Alberto; and Pagani, Mario, to Sagitta Officina Meccanica S.p.A. Binding machine for the application of a strip of flexible material around the outline of thin articles, particularly for edging parts for boots and shoes. 4,322,864, Cl. 12-24.500.

Bodine, Albert G. Vibratory apparatus for mining shale oil or the like. 4,323,119, Cl. 166-177.000.

Bodnar, Janos: *See—*
Lugosi, Gyorgy; May, Antal S.; Bodnar, Janos; Turcsan, Istvan; Jelinek, Istvan; Somfai, Eva; and Simandi, Laszlo, 4,323,469, Cl. 252-182.000.

Boehringer Ingelheim GmbH: *See—*
Voss, Gunther; and Gruber, Peter, 4,323,530, Cl. 264-109.000.

Boeing Company, The: *See—*
Loch, David M., 4,323,433, Cl. 204-56.00R.

Boesch, Harold E., Jr.: *See—*
McGarrity, James M.; and Boesch, Harold E., Jr., 4,323,842, Cl. 324-158.00R.

Boggavarapu, Rao L., to Westinghouse Electric Corp. Unitary ballast structure for operating four fluorescent lamps. 4,323,823, Cl. 315-254.000.

Bohner & Koehle GmbH & Co.: *See—*
Bosch, Walther, 4,322,960, Cl. 72-83.000.

Bolich, Raymond E., Jr.; Shaya, Steven A.; and Steuri, Christian, to Procter & Gamble Company, The. Process for making pyridinethione salts. 4,323,683, Cl. 546-6.000.

Bolleter, William T.; and Chandler, Carl D., Jr., to Hercules Incorporated. Process for purification of nitrocellulose. 4,323,669, Cl. 536-38.000.

Boman, Lars E.: *See—*
Ternstrom, Ingela M.; and Boman, Lars E., 4,323,070, Cl. 128-287.000.

Bomer, Bruno: *See—*
Schmitz-Josten, Robert; Dietrich, Manfred; and Bomer, Bruno, 4,323,696, Cl. 560-220.000.

Bonchek, Lawrence I.: *See—*
Rosenbluth, Robert F.; and Bonchek, Lawrence I., 4,323,072, Cl. 128-348.000.

Bonci, Frederick R.: *See—*
Greenwald, Edward H., Sr.; Greenwald, Edward H., Jr.; and Bonci, Frederick R., 4,323,281, Cl. 299-1.000.

Bond, Clarence D., to United States of America, Navy. Photographic image enhancement by a gold-toning neutron-activation process. 4,323,641, Cl. 430-370.000.

Bond, Joseph K.: *See—*
Korff, Wolfram G.; Emery, Vernon V.; and Bond, Joseph K., 4,323,337, Cl. 425-155.000.

Bonfield, John H.; Belsky, Stephen E.; and Pickens, Donald, to Allied Corporation. Production of acetaldehyde oxime. 4,323,706, Cl. 564-253.000.

Borg-Warner Corporation: *See—*
Smith, Edward M., 4,323,788, Cl. 307-66.000.
Wiese, Winfred J., 4,323,255, Cl. 277-81.00R.

Borgardt, Manfred: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; and Walkowiak, Michael, 4,323,348, Cl. 433-228.000.

Bornat, Alan, to Imperial Chemical Industries Limited; and University of Liverpool. Electrostatic spinning of tubular products. 4,323,525, Cl. 264-24.000.

Boros, Lawrence A., to Rockwell International Corporation. Method and apparatus for welding automotive brake shoes. 4,323,753, Cl. 219-107.000.

Boros, Lawrence A., to Rockwell International Corporation. Welding automotive brake shoes by high frequency resistance welding. 4,323,754, Cl. 219-107.000.

Borovcova, Zelmira: *See—*
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.

Borrelli, Nicholas F.; Luderer, Albert A.; and Panzarino, Joseph N., to Corning Glass Works. Radio frequency induced hyperthermia for tumor therapy. 4,323,056, Cl. 128-1.300.

Borrelli, Nicholas F.; and Young, Peter L., to Corning Glass Works. Positive imaging method using doped silver halide medium. 4,323,640, Cl. 430-353.000.

Bory, Barbara H.: *See—*
Curry, Janet C.; and Bory, Barbara H., 4,323,466, Cl. 252-106.000.

Bos, Wouter A., to Reba B.V. Cutter head with adjustable suction nozzle. 4,322,898, Cl. 37-64.000.

Bosch, Walther, to Bohner & Koehle GmbH & Co. Machine for forming of rotationally symmetrical workpieces. 4,322,960, Cl. 72-83.000.

Bosshard, Hans; Rempfler, Hermann; and Zweifel, Hans, to Ciba-Geigy Corporation. Process for the preparation of indenonecarboxylic acids. 4,323,701, Cl. 562-462.000.

Bost, Benjamin S. Wood finishing machine. 4,323,099, Cl. 144-3.00R.

Bott, John A. Luggage carrier assembly. 4,323,182, Cl. 224-321.000.

Boudault, Robert; and Pouzoullic, Gerard, to U.S. Philips Corporation. Frequency shift modulator with circuitry for simple change-over between high and low channels. 4,323,862, Cl. 332-9.00R.

Boudreau, Robert J. Two wheel roller ice skate. 4,323,259, Cl. 280-7.130.

Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, to L'Oreal. Anti-solar cosmetic composition. 4,323,549, Cl. 424-45.000.

Bouillon, Claude; and Darmenton, Patrick, to L'Oreal. Composition for strengthening and revitalizing brittle or damaged nails containing a salt of 2-benzylthio ethylamine. 4,323,553, Cl. 424-61.000.

Bourdon, Frederic. Syringe. 4,323,066, Cl. 128-218.00R.

Bourns, Inc.: *See—*
DeRouen, Joseph R.; and Smith, Ronald E., 4,323,293, Cl. 339-17.0CR.

Bousquet, Gilles: *See—*
Rambert, Andre; Bousquet, Gilles; and Rigal, Francois, 4,323,059, Cl. 128-80.00C.

Bouvaist, Jean: *See—*
Dubost, Bruno; and Bouvaist, Jean, 4,323,399, Cl. 148-12.70A.

Bowden, Robert L., Jr. Anatomical model. 4,323,350, Cl. 434-269.000.

Boyd, Thomas J., Jr.: *See—*
Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., 4,323,857, Cl. 372-2.000.

Brachten, Gert; Engelhardt, Friedrich; Helling, Heinz; and Ribka, Joachim, to Cassella Aktiengesellschaft. Dyeing of mixed fibers. 4,323,363, Cl. 8-532.000.

Brachthauser, Kunibert: *See—*
Herchenbach, Horst; Ramesohl, Hubert; and Brachthauser, Kunibert, 4,323,397, Cl. 106-100.000.

Brachthauser, Norbert. Diagram analyzing device with table of events for combined interpretation of plural curves. 4,323,766, Cl. 235-89.00R.

Bradler, Peter, to Siemens Aktiengesellschaft. Commutator motor useful for driving automatic washers. 4,323,831, Cl. 318-245.000.

Bradley, Norbert L.; Cleereman, Kenneth J.; and Wessling, Ritchie A., to Dow Chemical Company, The. Process for forming a plastic article. 4,323,531, Cl. 264-113.000.

Bradley, Richard S., to Weigh-Tronix, Inc. Mounting adapter for a fork lift truck. 4,323,132, Cl. 177-139.000.

Bradshaw, John: *See—*
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; MacKinnon, John W. M.; Judd, Duncan B.; and Carey, Linda, 4,323,566, Cl. 424-248.510.

Brady, Hugh D. Board game apparatus. 4,323,249, Cl. 273-249.000.

Bramhall, George H., to Monsanto Company. Rotary forming of articles. 4,323,533, Cl. 264-145.000.

Brandenfels, Carl. Folded box with puzzle. 4,323,154, Cl. 206-216.000.

Branick Mfg., Inc.: *See—*
Severson, Larry A., 4,323,414, Cl. 156-414.000.

Brannegan, Daniel P.: *See—*
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,323,506, Cl. 260-345.80R.

Brassfield, Robert W. Airlift type dredging apparatus. 4,322,897, Cl. 37-62.000.

Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., to United States of America, Energy. Catalac free electron laser. 4,323,857, Cl. 372-2.000.

Braun, Albert; Portz, Willi; and Strauss, Georg. Agent for desulfurizing crude iron and steel melts, and process for making it. 4,323,392, Cl. 75-58.000.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Conveying trough with mining machine cutter guide surfaces. 4,323,282, Cl. 299-43.000.

Braun, Gert: *See—*
Braun, Ernst; and Braun, Gert, 4,323,282, Cl. 299-43.000.

Braverman, Milton. Method for filling and assembling extended dispensing device. 4,322,930, Cl. 53-471.000.

Brazzale, Anthony John: *See—*
Brazzale, Gina, 4,322,866, Cl. 15-180.000.

Brazzale, Gina, to Brazzale, Anthony John. Polisher mounting means. 4,322,866, Cl. 15-180.000.

Breiman, Mark I.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Breinan, Edward M.: *See—*
Brown, Clyde O.; Breinan, Edward M.; and Kear, Bernard H., 4,323,756, Cl. 219-121.0LF.

Brennan, James F.: *See—*
Chen, Gwendyline Y. Y. T.; and Brennan, James F., 4,323,637, Cl. 430-271.000.

Brennan, Thomas M., to Baird Corporation. Wide field of view goggle system. 4,323,298, Cl. 350-36.000.

Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., to Pfizer Inc. Preparation of gamma-pyrones. 4,323,506, Cl. 260-345.80R.

Breslow, Ronald C. D.; and Wilcox, Craig S., to Schering Corporation. Process for the preparation of steroidal 17α-arylcarboxylates. 4,323,512, Cl. 260-397.470.

Bricout, Dominique: *See—*
Baudry, Hugues; Morhaim, Claude; and Bricout, Dominique, 4,323,652, Cl. 501-17.000.

Bridges, Clive A.; and O'Donnell, Patrick J., to Marconi Company Limited, The. Infrared parallel scanning arrangement. 4,323,776, Cl. 250-332.000.

Bridgestone Tire Company Limited: *See—*
Kadono, Mamoru; and Saigusa, Tetsuji, 4,323,089, Cl. 138-109.000.

British Aerospace: *See—*
Ball, James, 4,323,208, Cl. 244-3.280.

British Petroleum Company Limited, The: *See—*
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,323,475, Cl. 252-373.000.

British Steel Corporation: *See—*
Garner, Henry C.; and McGee, Lawrence, 4,323,717, Cl. 373-101.000.

Brock, James A. Pipe fitting device for plumbing systems. 4,323,270, Cl. 285-153.000.

Bromberg, Howard M., to Flexi-Group Inc., The. Rotatable wheel assembly. 4,323,609, Cl. 428-65.000.

Bronardi Inc.: *See—*
Magi, Hugo, 4,323,090, Cl. 141-70.000.

Brown, Anthony K. D., to Northern Telecom Limited. Idle channel noise suppressor for speech encoders. 4,323,730, Cl. 179-1.00P.

Brown, Clyde O.; Breinan, Edward M.; and Kear, Bernard H., to United Technologies Corporation. Method for fabricating articles by sequential layer deposition. 4,323,756, Cl. 219-121.0LF.

Brown, James N.; and Kalleberg, Melvin O., to Minnesota Mining and Manfacturing Company. Two strip materials used for forming fasteners. 4,322,875, Cl. 24-204.000.

Brown, Michael J.: *See—*
Wexler, Allan; Chakrabarti, Paritosh M.; and Brown, Michael J., 4,323,710, Cl. 568-315.000.

Brown, Richard P.: *See—*
Peters, Arthur; Negi, Virendra S.; Cushing, David E.; Brown, Richard P.; and Joyce, Thomas F., 4,323,967, Cl. 364-200.000.

Brown & Williamson Tobacco Corporation: *See—*
Cogbill, Philip H., II, 4,323,083, Cl. 131-305.000.
Jenkins, Carl B., Jr.; Porenski, Harry S., Jr.; and Turner, Paul N., 4,323,084, Cl. 131-319.000.

Broyhill Company, The: *See—*
Oberg, Robert E.; Stewart, Clarence E.; and Geelan, Thomas C., 4,323,313, Cl. 366-142.000.

Bruckenstein, Stanley, to Andco Industries, Inc. Process for purifying water containing fluoride ion. 4,323,462, Cl. 210-714.000.

Brunelle, Daniel J., to General Electric Company. (Ortho-alkoxycarbonyaryl)-carbonate transesterification. 4,323,668, Cl. 528-173.000.

Bruning, Armin M.: *See—*
Kamp, Eugene L.; Popeck, Charles A.; and Bruning, Armin M., 4,323,871, Cl. 337-7.000.

Brunner, Heinrich; and Fischer, Karin, to Siemens Aktiengesellschaft. Method and circuit arrangement for generating setting signals for signal generators of a traffic signal system, particularly a street traffic signal system. 4,323,970, Cl. 364-436.000.

Brunner, Josef: *See—*
Rock, Erich; and Brunner, Josef, 4,323,213, Cl. 248-222.100.

Brunner, Rudolf, to Heilmeier & Weinlein, Fabrik fur Oel-Hydraulik GmbH & Co. KG. Control valve. 4,323,087, Cl. 137-625.680.

Brunswick Corporation: *See—*
Neufeld, Henry L., 4,323,203, Cl. 242-84.20A.
Rush, Charles R., 4,323,605, Cl. 428-17.000.

Brzezinski, Vincent: *See—*
Flax, Louis; and Brzezinski, Vincent, 4,323,739, Cl. 179-189.00D.

Buck, Ollie G., to Phillips Petroleum Company. Conjugated diene/-monovinyl aromatic copolymer-based heat contractible film coatings on glass bottle. 4,323,606, Cl. 428-35.000.

Buckley, John P.: *See—*
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.

Bugaut, Andree; and Junino, Alex, to L'Oreal. Dyeing compositions for hair which contain 2,4-diamino-butoxybenzene and/or a salt thereof as the coupling agent. 4,323,360, Cl. 8-407.000.

Buhring, Otto; Dreessen, Gerardus J. W.; Groeneveld, Jacob W. H.; Queck, Robert; Thome, Heinrich; and Willemsen, Gerrit J., to Hoechst Aktiengesellschaft. Arc furnace roof. 4,323,718, Cl. 373-73.000.

Buller-Colthurst, Guy E., to Knud Simonsen Industries Limited. Multiple stick for smoke house. 4,322,874, Cl. 17-44.400.

Bulteau, Gerard: *See—*
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Collignon, Claude, 4,323,503, Cl. 260-340.300.

Burg, Karlheinz: *See—*
Muck, Karl-Friedrich; Sextro, Gunter; and Burg, Karlheinz, 4,323,502, Cl. 260-340.000.

Burroughs Wellcome Co.: *See—*
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,323,679, Cl. 544-256.000.
Schaeffer, Howard J., 4,323,573, Cl. 424-253.000.

Burst, Hermann: *See—*
Soderberg, Richard; Winter, Steven; and Burst, Hermann, 4,323,274, Cl. 296-1.00S.

Burton, Clark R., to Compair, Inc. Method and apparatus for open flow area classification. 4,322,887, Cl. 33-174.00C.

Busing, David W. Solid geometrical puzzle method of assembling means. 4,323,244, Cl. 273-155.000.

Buurma, Gerald B., to National Semiconductor Corporation. CMOS Analog to digital converter with selectable voltage follower buffering. 4,323,887, Cl. 340-347.0AD.

Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, to Bayer Aktiengesellschaft. Coating iron oxide particles for magnetic recording. 4,323,596, Cl. 427-127.000.

Bylund, Don M.: *See—*
Greenway, John M.; and Bylund, Don M., 4,323,760, Cl. 219-364.000.

Byrne, Joe L.; Kobayashi, Robert J.; and Nancarrow, James H., to Garrett Corporation, The. Hydraulic assist turbocharger system. 4,322,949, Cl. 60-606.000.

C. L. Frost & Son, Inc.: *See—*
Smith, Harvey E., Sr.; and Weis, Siegfried K., 4,323,288, Cl. 308-196.000.

C. van der Lely N.V.: *See—*
van der Lely, Cornelis; and van der Lely, Ary, 4,323,136, Cl. 180-271.000.

Caby, Jean-Claude; and Girardin, Jean-Claude, to Portescap. Direct current micromotor. 4,323,805, Cl. 310-237.000.

Calawa, Arthur R.; Gormley, Joseph V.; and Manfra, Michael J. Method for preparing optically flat damage-free surfaces. 4,323,422, Cl. 156-636.000.

Callahan, James L.: *See—*
Hardman, Harley F.; Callahan, James L.; and Grasselli, Robert K., 4,323,520, Cl. 260-465.900.

Callahan, Kevin M., to International Paper Company. Method and apparatus for dispensing flexible trays. 4,323,168, Cl. 221-42.000.

Cam Gears Limited: *See—*
Adams, Frederick J.; and Downing, Philip A., 4,322,986, Cl. 74-89.180.

Campbell, Joe C.; and Lee, Tien P., to Bell Telephone Laboratories, Incorporated. Demultiplexing photodetectors. 4,323,911, Cl. 357-30.000.

Campen, David C.: *See*—
Crosby, Alan C.; and Campen, David C., 4,323,365, Cl. 23-313.00R.

Camplin, Harry R.: *See*—
Monson, Donald R.; and Camplin, Harry R., 4,323,369, Cl. 55-1.000.

Canavesi, Roberto; Ligorati, Ferdinando; and Aglietti, Giancarlo, to Societa' Italiana Resine S.I.R. S.p.A. Process and catalyst for the production of dichloroethane. 4,323,716, Cl. 570-243.000.

Cannuli, Vincent M.: *See*—
Vieland, Leon J.; and Cannuli, Vincent M., 4,323,813, Cl. 313-250.000.

Canon Kabushiki Kaisha: *See*—
Aoki, Kanemasa, 4,323,806, Cl. 310-266.000.
Fujii, Motoharu; Koumura, Noboru; Ayata, Naoki; Saito, Seiji; and Sato, Yasushi, 4,323,919, Cl. 358-75.000.
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Mohvama, Yoshikuni, 4,323,306, Cl. 355-15.000.
Kawamura, Naoto; Masegi, Koichi; Hakamada, Isao; Uchiyama, Haruo; Kitamura, Takashi; and Ishii, Masaaki, 4,323,297, Cl. 350-6.800.
Kitajima, Tadayuki; and Tohyama, Yoshikuni, 4,323,308, Cl. 355-57.000.
Satoh, Toshihiko, 4,323,305, Cl. 354-106.000.

Canon Seiki Kabushiki Kaisha: *See*—
Aoki, Kanemasa, 4,323,806, Cl. 310-266.000.

Canty, Herbert G., to Kendall Company, The. Surgical drape with retaining device. 4,323,062, Cl. 128-132.00D.

Capizzi, Amedeo: *See*—
Dal Moro, Anacleto; Pinamonti, Franco; and Capizzi, Amedeo, 4,323,556, Cl. 424-84.000.

Capozzi, Anthony J., to International Business Machines Corporation. Multilevel storage system having unitary control of data transfers. 4,323,968, Cl. 364-200.000.

Carboline Company: *See*—
Montle, John F.; Markowski, Henry J.; Lodewyck, Paul D.; and Schneider, Daniel F., III, 4,323,690, Cl. 556-470.000.

Carey, Linda: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; MacKinnon, John W. M.; Judd, Duncan B.; and Carey, Linda, 4,323,566, Cl. 424-248.510.

Carlin, Jack M. Automatic hose clamp. 4,323,219, Cl. 251-5.000.

Carlin, William W., to PPG Industries, Inc. Method of operating a solid polymer electrolyte chlor-alkali cell. 4,323,435, Cl. 204-98.000.

Carlson, Bertyl W., to Acme Machine Company. Dog jump apparatus. 4,323,034, Cl. 119-29.000.

Carolina Enterprises, Inc.: *See*—
McIntosh, James K.; and Numata, M., 4,323,047, Cl. 124-1.000.

Carpenter, Lowell L., to Litton Systems, Inc. Bar code controlled microwave oven. 4,323,773, Cl. 235-473.000.

Carpenter, Richard: *See*—
Stewart, William J.; Robinson, John A.; and Carpenter, Richard, 4,323,300, Cl. 350-96.210.

Carrier Corporation: *See*—
Zimmerman, Charles J., 4,323,116, Cl. 165-97.000.

Carriere, Joseph F.; Gaunt, Wilmer B., Jr.; Landry, Joseph E.; and Spires, Dewayne A., to Bell Telephone Laboratories, Incorporated. Noise and crosstalk reduction in mid-riser biased encoders. 4,323,885, Cl. 340-347.0CC.

Cassella Aktiengesellschaft: *See*—
Brachten, Gert; Engelhardt, Friedrich; Helling, Heinz; and Ribka, Joachim, 4,323,363, Cl. 8-532.000.

Castro, Albert: *See*—
Monji, Nobuo; and Castro, Albert, 4,323,647, Cl. 435-7.000.

Catastini, Alberto: *See*—
Radaelli, Dario; De Angelis, Giancarlo; and Catastini, Alberto, 4,323,976, Cl. 364-565.000.

Caterpillar Tractor Co.: *See*—
Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., 4,323,401, Cl. 148-39.000.
Witzenburg, Marion J., 4,323,452, Cl. 210-188.000.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Dubost, Bruno; and Bouvaist, Jean, 4,323,399, Cl. 148-12.70A.

Central Electrical Company: *See*—
Day, Thomas J., 4,323,821, Cl. 315-87.000.

Central Soya Company, Inc.: *See*—
Saldien, Karel F., 4,323,584, Cl. 426-285.000.

Centro Di Ricera Enrico Longinotti Firenze S.p.A.: *See*—
Longinotti, Alfredo, 4,323,178, Cl. 222-415.000.

Cezar International, Ltd.: *See*—
Cezar, Robert M.; and Paz, Alberto B., 4,323,915, Cl. 358-4.000.

Cezar, Robert M.; and Paz, Alberto B., to Cezar International, Ltd. Method and an apparatus for video tape recording. 4,323,915, Cl. 358-4.000.

Chakrabarti, Paritosh M.: *See*—
Wexler, Allan; Chakrabarti, Paritosh M.; and Brown, Michael J., 4,323,710, Cl. 568-315.000.

Chalker, Oliver H., Jr.; and Spooner, Robert J. Automated time and attendance system. 4,323,771, Cl. 235-377.000.

Chamness, Addison B., Jr.: *See*—
Erwin, William L.; and Chamness, Addison B., Jr., 4,323,044, Cl. 123-557.000.

Chandler, Carl D., Jr.: *See*—
Bolleter, William T.; and Chandler, Carl D., Jr., 4,323,669, Cl. 536-38.000.

Chang, David T. L., to Recortec, Inc. Slow moving video tape reproduction. 4,323,930, Cl. 360-10.000.

Chang, Kern K. N., to RCA Corporation. System for enhancing deflection in kinescopes. 4,323,816, Cl. 313-433.000.

Chang, Ying-Chung. Air separator for air compressor. 4,323,375, Cl. 55-270.000.

Chao, Sam T.: *See*—
Varma, Ravi K.; and Chao, Sam T., 4,323,511, Cl. 260-397.450.

Charrier, Denis: *See*—
Bloch, Bertrand; Meyer, Chantal C.; and Charrier, Denis, 4,323,695, Cl. 560-145.000.

Chase, Norman E.: *See*—
Abele, Manlio; Passalaqua, Anthony M.; and Chase, Norman E., 4,322,974, Cl. 73-602.000.

Chattha, Mohinder S., to Ford Motor Company. Composition with latent reactive catalyst - 5. 4,323,660, Cl. 525-161.000.

Check, Kenneth A., to Hewlett-Packard Company. Power supply with resonant inverter circuit using variable frequency control for regulation. 4,323,959, Cl. 363-40.000.

Chen, Gwendyline Y. Y. T., to Du Pont de Nemours, E. I., and Company. Photosensitive block copolymer composition and elements. 4,323,636, Cl. 430-271.000.

Chen, Gwendyline Y. Y. T.; and Brennan, James F., to Du Pont de Nemours, E. I., and Company. Use of cover sheet and interposed flexible film with block copolymer composition. 4,323,637, Cl. 430-271.000.

Chervenak, Michael C.; Johanson, Edwin S.; and Rakow, Marvin S., to Hydrocarbon Research, Inc. Multi-zone coal conversion process using particulate carrier material. 4,323,446, Cl. 208-8.00R.

Chianelli, Russell R.: *See*—
Dines, Martin B.; and Chianelli, Russell R., 4,323,480, Cl. 252-439.000.

Chiba, Kazumasa; Egawa, Keiichi; and Muraki, Toshio, to Toray Industries, Inc. Photosensitive polyamide resin composition. 4,323,639, Cl. 430-281.000.

Chicago Bridge & Iron Company: *See*—
Stafford, Donald C.; and Allo, Vincent F., 4,323,115, Cl. 165-79.000.

Chiecchi, Cesare, to U.S. Philips Corporation. Method of introducing an anti-microphony sponge into an air-cored coil. 4,322,884, Cl. 29-602.00R.

Chigirinsky, Alexandr A.: *See*—
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.

Chikazumi, Nobutoshi: *See*—
Mukoyama, Yoshiyuki; and Chikazumi, Nobutoshi, 4,323,664, Cl. 526-88.000.

Childers, John S.; and Mayo, Terry H., to Reed Rock Bit Company. Thrust face bearing structure for rolling cutter drill bit. 4,323,284, Cl. 308-8.200.

Chilson, Richard E. Apparatus for continuously leaching ore. 4,323,539, Cl. 422-278.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See*—
Lugosi, Gyorgy; May, Antal S.; Bodnar, Janos; Turcsan, Istvan; Jelinek, Istvan; Somfai, Eva; and Simandi, Laszlo, 4,323,469, Cl. 252-182.000.

Chisso Corporation: *See*—
Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, 4,323,626, Cl. 428-374.000.

Chiu, Te-Long. Chime unit for electric clock and mechanical clock. 4,323,995, Cl. 368-75.000.

Chiyoda, Tsuneyuki; and Ohtani, Masami, to Diesel Kiki Co., Ltd. Humidifying apparatus for an air-conditioning equipment. 4,323,191, Cl. 236-44.00A.

Chlad, Kenneth J., to Magnetics International, Inc. Hydraulic-driven electro-lifting device. 4,323,329, Cl. 414-737.000.

Chodorow, Marvin: *See*—
Shaw, Herbert J.; and Chodorow, Marvin, 4,323,310, Cl. 356-350.000.

Chong, Sooi: *See*—
Jardine, Colin D.; Chong, Sooi; Coles, Rodney H.; and Hebb, Stephen, 4,323,199, Cl. 241-284.000.

Chubraeva, Lidia I.: *See*—
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.

Ciba Geigy AG: *See*—
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,323,682, Cl. 544-353.000.

Ciba-Geigy Corporation: *See*—
Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, 4,323,560, Cl. 424-177.000.
Bentz, Rolf; and Fattinger, Volker, 4,323,372, Cl. 55-59.000.
Bosshard, Hans; Rempfler, Hermann; and Zweifel, Hans, 4,323,701, Cl. 562-462.000.
Ehrenfreund, Josef, 4,323,579, Cl. 424-322.000.
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,323,688, Cl. 548-330.000.
Pissiotas, Georg; Durr, Dieter; Rohr, Otto; and Lukaszczyk, Alfons, 4,323,388, Cl. 71-88.000.

Topfl, Rosemarie, 4,323,490, Cl. 523-409.000.

Cioccio, Armand: *See—*
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.

Civolani, Bruno, to Benelli Armi S.p.A. Trigger mechanism for automatic and semiautomatic firearms of any type. 4,322,906, Cl. 42-70.00E.

Claas OHG: *See—*
Hollmann, Bernd, 4,322,937, Cl. 56-10.200.

Clarion Co., Ltd.: *See—*
Sato, Tadashi; Hara, Toyoji; and Tomita, Tadashi, 4,323,787, Cl. 307-38.000.

Clark, Bernard T.: *See—*
Berndlmaier, Erich; Clark, Bernard T.; and Dorler, Jack A., 4,323,914, Cl. 357-82.000.

Clark, Charles A., Jr.; and Easter, Finis C., to Sperry Corporation. Voltage supression circuit for a voltage converter circuit. 4,323,957, Cl. 363-21.000.

Clark, John P.; Michaelis, Jack H.; and Malcik, Frank J., to Wilson Jones Company. Slide compression mechanism for flexible post binder. 4,323,318, Cl. 402-17.000.

Claybaker, LeRoy A., to General Electric Company. Process of impregnating paper laminate plies with oil modified phenolic resole varnish. 4,323,412, Cl. 156-335.000.

Cleereman, Kenneth J.: *See—*
Bradley, Norbert L.; Cleereman, Kenneth J.; and Wessling, Ritchie A., 4,323,531, Cl. 264-113.000.

Clemmons, Quentin T.: *See—*
Morris, Robert B.; and Clemmons, Quentin T., 4,323,144, Cl. 188-196.00A.

Clippard Instrument Laboratory, Inc.: *See—*
Clippard, William L., III, 4,323,003, Cl. 92-87.000.

Clippard, William L., III, to Clippard Instrument Laboratory, Inc. Fluid cylinder with replaceable rod seal and guide. 4,323,003, Cl. 92-87.000.

Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; MacKinnon, John W. M.; Judd, Duncan B.; and Carey, Linda, to Glaxo Group Limited. Triazole acylamines, pharmaceutical compositions thereof and method of use thereof. 4,323,566, Cl. 424-248.510.

Close, Donald, to David Hudson, Inc. Fluoroelastomer film compositions containing silane compounds and method for the preparation thereof. 4,323,603, Cl. 524-545.000.

Close, Sam. Clamp assembly. 4,323,226, Cl. 269-208.000.

Clover, Richmond B.: *See—*
Lee, David M.; Rose, Donald K.; and Clover, Richmond B., 4,323,983, Cl. 365-8.000.

Clune, Charles A., to Midmark Corporation. Self-propelled, non-riding trenching machine with a steering mechanism. 4,322,899, Cl. 37-86.000.

Coal Industry (Patents) Limited: *See—*
Wykes, John S.; and Adsley, Ian, 4,323,778, Cl. 250-367.000.

Coalex, Inc.: *See—*
Lansberry, John B.; Apt, Jerome, Jr.; and Dury, Joseph D., Jr., 4,323,280, Cl. 299-1.000.

Coats and Clark, Inc.: *See—*
Jungerwirth, Bernard R., 4,323,237, Cl. 272-131.000.

Cogbill, Philip H., II, to Brown & Williamson Tobacco Corporation. Method for separating veins from lamina of tobacco leaf. 4,323,083, Cl. 131-305.000.

Coghill, Marvin: *See—*
Eberhardt, Timothy J., 4,323,324, Cl. 408-124.000.

Cognion, Jean-Marie; and Kervennal, Jacques, to P C U K Produits Chimiques Ugine Kuhlmann. Process for the preparation of organic isocyanates from nitro derivatives. 4,323,515, Cl. 260-453.00P.

Cohnen, Erich: *See—*
Stenzel, Wolfgang; Fleck, Wolfgang; Cohnen, Erich; and Armah, Ben, 4,323,570, Cl. 424-251.000.

Cole, James A., to Megadata Corporation. Keyboard system with variable automatic repeat capability. 4,323,888, Cl. 340-365.00A.

Coles, Rodney H.: *See—*
Jardine, Colin D.; Chong, Sooi; Coles, Rodney H.; and Hebb, Stephen, 4,323,199, Cl. 241-284.000.

Collender, Robert B. Stereoscopic television (unaided with lip sync) on standard bandwidth-method and apparatus. 4,323,920, Cl. 358-88.000.

Collignon, Claude: *See—*
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Collignon, Claude, 4,323,503, Cl. 260-340.300.

Collins, Frederick H., to Valcour Imprinted Papers, Inc. Method and apparatus for making large size, low density, elongated thermoplastic cellular bodies. 4,323,528, Cl. 264-53.000.

Columbus, Richard L., to Eastman Kodak Company. Multi-analyte test device. 4,323,536, Cl. 422-56.000.

Combined Optical Industries Ltd.: *See—*
Pasco, Ian K., 4,323,951, Cl. 362-27.000.

Comello, Corrado: *See—*
Foscarini, Anthony; Foscarini, John; and Comello, Corrado, 4,323,140, Cl. 182-128.000.

Communications Satellite Corporation: *See—*
Ali, Zaheer M., 4,324,000, Cl. 370-85.000.
Rhodes, Smith A., 4,324,001, Cl. 375-90.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,323,927, Cl. 358-296.000.

Compagnie International pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Lazzari, Jean-Pierre; and Desserre, Jacques, 4,323,941, Cl. 360-123.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Lazzari, Jean P., 4,323,940, Cl. 360-113.000.

Compair, Inc.: *See—*
Burton, Clark R., 4,322,887, Cl. 33-174.00C.

Compton, Donald B.; Lewis, William P.; and Trinh, Toan, to Procter & Gamble Company, The. Wick-type slow diffusion dispenser. 4,323,193, Cl. 239-44.000.

Connaught Laboratories Limited: *See—*
Sun, Anthony M.; and Parisius, Wolf J., 4,323,457, Cl. 210-645.000.

Conrad, Bernhard, to Siemens Aktiengesellschaft. Diagnostic radiology apparatus for producing layer images. 4,323,784, Cl. 250-445.00T.

Conradsen, Arne: *See—*
Heggebo, Trygve; and Conradsen, Arne, 4,323,386, Cl. 71-35.000.

Consortium fur elektrochemische Ind. GmbH: *See—*
Schilling, Bernd, 4,323,678, Cl. 544-243.000.

Container Corporation of America: *See—*
Dickerson, Robert B., 4,323,188, Cl. 229-41.00R.

Control Data Corporation: *See—*
Hester, Richard E., 4,323,854, Cl. 330-256.000.

Conway, William H.: *See—*
Willson, James R.; Conway, William H.; and Smith, William N., 4,323,764, Cl. 219-497.000.

Coogler, John M., to Geosource Inc. Geophone spring. 4,323,994, Cl. 367-183.000.

Cook, Craig A.; and Cook, Gary B. Bicycle front fork assembly. 4,323,263, Cl. 280-279.000.

Cook, Francis J.: *See—*
Abell, Gurdon R.; Cook, Francis J.; and Howes, Peter D., 4,323,925, Cl. 358-213.000.

Cook, Gary B.: *See—*
Cook, Craig A.; and Cook, Gary B., 4,323,263, Cl. 280-279.000.

Cooper, Christopher A., to Marley Tile AG. Roof ridge capping. 4,322,924, Cl. 52-57.000.

Cooper Tire & Rubber Company: *See—*
Fitzpatrick, Cecil C.; and Spurgat, Jimmy C., 4,322,963, Cl. 72-387.000.

Coors Container Company: *See—*
McMillin, Danny L.; and Stirbis, James S., 4,323,601, Cl. 427-287.000.

Copperthwaite, Martin: *See—*
Roberts, Michael A.; and Copperthwaite, Martin, 4,323,529, Cl. 264-69.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Composites of grafted olefin polymers and cellulose fibers. 4,323,625, Cl. 428-361.000.

Cordes, William J. Hole digging apparatus and method. 4,323,129, Cl. 175-285.000.

Corey, Gerald D., to Fansteel Inc. Cluster heat exchanger. 4,323,114, Cl. 165-78.000.

Cornell Research Foundation, Inc.: *See—*
Kuckes, Arthur F., 4,323,848, Cl. 324-338.000.

Corning Glass Works: *See—*
Borrelli, Nicholas F.; Luderer, Albert A.; and Panzarino, Joseph N., 4,323,056, Cl. 128-1.300.
Borrelli, Nicholas F.; and Young, Peter L., 4,323,640, Cl. 430-353.000.
Gulati, Suresh T., 4,323,614, Cl. 428-116.000.
Holland, Hans J.; and Megles, John E., Jr., 4,323,653, Cl. 501-32.000.
Tick, Paul A.; and Sanford, Leon M., deceased, 4,323,654, Cl. 501-47.000.

Corvinus & Roth GmbH: *See—*
Zabel, Bernd G., 4,323,092, Cl. 137-5.000.

COS Electronics Corporation: *See—*
Ferris, Harold, 4,323,073, Cl. 128-419.00R.

Cosco Industries, Inc.: *See—*
Laverty, Gerald C., 4,323,202, Cl. 242-68.500.

Coste, Jean C., to Regie Nationale des Usines Renault. Display device for dashboard of automobile. 4,323,895, Cl. 340-782.000.

Courtin, Gerard C. L. Display case for a luxury article. 4,323,153, Cl. 206-45.130.

Coutures, Jean L.: *See—*
Berger, Jean L.; and Coutures, Jean L., 4,323,791, Cl. 307-221.00D.

Covington, John B.: *See—*
Wendling, Larry A.; and Covington, John B., 4,323,591, Cl. 427-53.100.

Cowan, Wavell F.; Green, Marshall S.; and McGurk, Stanley E., to Inotech Process Ltd. Crafted paper making machine. 4,323,426, Cl. 162-398.000.

Cowgill, Ronald H., to Procter & Gamble Company, The. Use of a vibrating screen to separate small live insects from agricultural commodities. 4,323,160, Cl. 209-632.000.

CPT Corporation: *See—*
Lehman, Frederick D., 4,323,826, Cl. 315-408.000.

Crane Co.: *See—*
Skarvada, Thomas, 4,323,969, Cl. 364-426.000.

Creighton, Robert A.; and Engel, Stephen M., to United States of America, Navy. Target detecting device with improved counter-countermeasures capability. 4,323,897, Cl. 343-18.00E.

Cremona, Angelo. Log slicing process to produce veneer. 4,323,101, Cl. 144-323.000.

Crespi, Carlo. Metering device for liquids, in particular alcoholic liquors or spirits. 4,323,179, Cl. 222-449.000.

Crest Industries, Inc.: *See*—
Kimzey, Gene A., 4,323,734, Cl. 179-18.0FA.

Creusot-Loire: *See*—
Lantin, Patrice; and Pere, Gerard, 4,323,442, Cl. 204-237.000.
Pere, Gerard, 4,323,443, Cl. 204-253.000.

Criss, Russell C.; and Stofka, Edward J., to PPG Industries, Inc. Electrical bus bar assembly. 4,323,726, Cl. 174-68.500.

Crockford, David R.; and Rhodes, Buck A., to Nuc Med Inc.; and University Patents Inc. Method and composition for cancer detection in humans. 4,323,546, Cl. 424-1.000.

Crosby, Alan C.; and Campen, David C., to Occidental Research Corporation. Dewatering of solid residues of carbonaceous materials. 4,323,365, Cl. 23-313.00R.

Crosby, Samuel C., Jr.: *See*—
Whorton, Robert B., III; Crosby, Samuel C., Jr.; Iannelli, Frank M.; Denmark, James; and Jeans, Edward L., 4,323,171, Cl. 222-82.000.

Crouse-Hinds Company: *See*—
Berg, Arthur H., 4,323,727, Cl. 174-135.000.

Cruz, Frank, Sr.: *See*—
Remillard, Gerard J.; Cruz, Frank, Sr.; Devoss, Daniel W., Jr.; and Miller, Truman A., 4,322,992, Cl. 82-34.00R.

Culpeper, Michael L. Convertible coaster having runners or wheels. 4,323,258, Cl. 280-7.120.

Cunningham, James D. Electrically operated impact tool. 4,323,127, Cl. 173-53.000.

Curry, Janet C.; and Bory, Barbara H., to Lever Brothers Company. Germicide. 4,323,466, Cl. 252-106.000.

Cushing, David E.: *See*—
Peters, Arthur; Negi, Virendra S.; Cushing, David E.; Brown, Richard P.; and Joyce, Thomas F., 4,323,967, Cl. 364-200.000.

Cutting, Alan B., to E M I - Varian Limited. Spin-tuned magnetron. 4,323,819, Cl. 315-39.610.

D. Swarovski & Co.: *See*—
Poll, Martin, 4,323,611, Cl. 428-67.000.

Daicel Chemical Industries, Ltd.: *See*—
Oka, Yoshitake; Ishihara, Tetsuo; Suzuki, Masane; and Kanaya, Motonori, 4,323,757, Cl. 219-121.0LN.

Daimler-Benz Aktiengesellschaft: *See*—
Lutz, Horst, 4,323,228, Cl. 269-296.000.

Dal Moro, Anacleto; Pinamonti, Franco; and Capizzi, Amedeo, to Montedison S.p.A. Solid formulations containing pheromones and method of using same. 4,323,556, Cl. 424-84.000.

Dale, Charles H., to Pav-Saver Mfg. Co. Track driven machines with auxiliary cable-winch drive. 4,323,321, Cl. 404-105.000.

Damen, Johannes P. M.; and Pistorius, Johannes A., to U.S. Philips Corporation. Single crystal of calcium-gallium germanium garnet and substrate manufactured from such a single crystal and having an epitaxially grown bubble domain film. 4,323,618, Cl. 428-212.000.

D'Amico, John J., to Monsanto Company. N-Amides of 2-benzothiazolinone. 4,323,677, Cl. 544-135.000.

D'Amico, John J.; and Marvel, John T., to Monsanto Company. Benzothiazoleethanimidamides. 4,323,686, Cl. 548-165.000.

Dana Corporation: *See*—
Gray, Larry O., 4,323,134, Cl. 180-176.000.
Young, Richard N.; and Williams, James A., 4,323,827, Cl. 318-3.000.

Dana, William R.; Friedrich, Ralph S.; and McKenney, John D., to Ameron, Inc. Filament winding of plastic articles. 4,323,408, Cl. 156-175.000.

Danfoss A/S: *See*—
Hansen, Christian B., 4,323,335, Cl. 418-61.00B.
Huelle, Zbigniew R.; and Nielsen, Leif, 4,323,220, Cl. 251-11.000.

Danilevich, Yanush B.: *See*—
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.

Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K. Electric machine. 4,323,803, Cl. 310-59.000.

Danzin, Charles: *See*—
Metcalf, Brian W.; Jung, Michel; and Danzin, Charles, 4,323,704, Cl. 562-561.000.

Darmenton, Patrick: *See*—
Bouillon, Claude; and Darmenton, Patrick, 4,323,553, Cl. 424-61.000.

Data General Corporation: *See*—
Gruner, Ronald H., 4,323,964, Cl. 364-200.000.

Datho Mfg. Inc.: *See*—
Thompson, Elmer R., 4,323,020, Cl. 112-61.000.

David Hudson, Inc.: *See*—
Close, Donald, 4,323,603, Cl. 524-545.900.

Davidson, Kenneth L.: *See*—
Wood, William D.; and Davidson, Kenneth L., 4,323,894, Cl. 340-764.000.

Davis, Dwight M., Jr., to Western Electric Company, Incorporated. Two-piece strain relief and connectorized flat cable assembly formed therewith. 4,323,295, Cl. 339-107.000.

Davis, Edwin D. Laser excited thermionic electric converter. 4,323,808, Cl. 310-306.000.

Dawson, Peter; and Phillips, John H., to Kelvin Lenses Limited. Measurement of articles. 4,323,850, Cl. 324-439.000.

Day, Thomas J., to Central Electrical Company. Luminaire converter. 4,323,821, Cl. 315-87.000.

Dayco Corporation: *See*—
Kleykamp, Donald L., 4,323,751, Cl. 219-91.210.
Richmond, Kenneth D., 4,322,916, Cl. 51-78.000.

De Angelis, Giancarlo: *See*—
Radaelli, Dario; De Angelis, Giancarlo; and Catastini, Alberto, 4,323,976, Cl. 364-565.000.

DeCarlo, Joseph D.: *See*—
Paulis, George J.; and DeCarlo, Joseph D., 4,323,094, Cl. 137-68.00R.

Decuyper, Jean-Claude: *See*—
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,323,927, Cl. 358-296.000.

Deepsea Ventures, Inc.: *See*—
Latimer, John P., 4,323,216, Cl. 248-550.000.

Degen, Hans-Juergen; and Grychtol, Klaus, to BASF Aktiengesellschaft. Dyed paper. 4,323,362, Cl. 8-506.000.

de Klein, Willem J.: *See*—
Zeilstra, Jacobus J.; de Klein, Willem J.; and Bik, Joannes D., 4,323,495, Cl. 524-156.000.

de Kok, Johan; and van Dongeren, Jan P., to Wavin B.V. Device for manufacturing plastics pipes with oblong channels. 4,323,339, Cl. 425-199.000.

Dell, Hans-Dieter: *See*—
Opitz, Wolfgang; Etscherberg, Eugen; Dell, Hans-Dieter; and Jacobi, Haireddin, 4,323,517, Cl. 260-455.00R.

DeLuca, Nicholas E. Book reading rest. 4,323,214, Cl. 248-452.000.

Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, to American Home Products Corporation. Antihypertensive tricyclic isoindole derivatives. 4,323,572, Cl. 424-251.000.

Demetrescu, Mihai C., to University of California, The Regents of the. Aperiodic analysis system, as for the electroencephalogram. 4,323,079, Cl. 128-731.000.

Demonte, Filippo; and Figini, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic typewriter with display device. 4,323,315, Cl. 400-63.000.

Dempster, David F.; and Wilson, John J. Control systems for hydraulically operated elements circuits or systems. 4,323,222, Cl. 254-274.000.

Denmark, James: *See*—
Whorton, Robert B., III; Crosby, Samuel C., Jr.; Iannelli, Frank M.; Denmark, James; and Jeans, Edward L., 4,323,171, Cl. 222-82.000.

Dennis, Dwight L.; and Mannschreck, William A., to United States of America, Navy. Armor fabrication. 4,323,000, Cl. 89-36.00A.

Dennis, Mahlon, to Strata Bit Corporation. Drill bit. 4,323,130, Cl. 175-329.000.

Denny, Barry D.: *See*—
Denny, Russell W.; and Denny, Barry D., 4,323,608, Cl. 428-43.000.

Denny, Russell W.; and Denny, Barry D. Label. 4,323,608, Cl. 428-43.000.

Denoor, Gaston; and Thillet, Georges, to B.V.S. Apparatus and method for winding an elongate member onto a body under tension. 4,323,200, Cl. 242-7.210.

den Toonder, Pieter; Doles, Glenn P.; Lund, John A.; Merrell, Richard G.; and Stubbs, Graham S., to Oak Industries Inc. Television coding system with channel level identification. 4,323,922, Cl. 358-117.000.

DeRouen, Joseph R.; and Smith, Ronald E., to Bourns, Inc. Terminal lead with labyrinthine clip. 4,323,293, Cl. 339-17.0CR.

DesMarais, Thomas A., to Procter & Gamble Company, The. Extrusion process for thermoplastic resin composition for fabric fibers with exceptional strength and good elasticity. 4,323,534, Cl. 264-176.00R.

Despatch Industries, Inc.: *See*—
Melgaard, Hans L.; and Mercier, Gary H., 4,322,964, Cl. 73-1.00G.

Desserre, Jacques: *See*—
Lazzari, Jean-Pierre; and Desserre, Jacques, 4,323,941, Cl. 360-123.000.

Detty, Garnett E. Ankle brace. 4,323,058, Cl. 128-80.00H.

Deubel, Reinhold: *See*—
Ehl, Klaus; and Deubel, Reinhold, 4,323,396, Cl. 106-23.000.

Deutsch, Reinhard. Pinball game apparatus. 4,323,241, Cl. 273-121.00A.

Devoss, Daniel W., Jr.: *See*—
Remillard, Gerard J.; Cruz, Frank, Sr.; Devoss, Daniel W., Jr.; and Miller, Truman A., 4,322,992, Cl. 82-34.00R.

de Waard, Peter J., to U.S. Philips Corporation. Injection laser. 4,323,856, Cl. 372-46.000.

De Wames, Roger E.; Hall, William F.; Ho, William W.; and Lim, Teong C., to Rockwell International Corporation. Monolithic, voltage controlled, phased array. 4,323,901, Cl. 343-754.000.

D'ham, Reinhold: *See*—
Weghaupt, Erich; and D'ham, Reinhold, 4,323,801, Cl. 310-52.000.

Dhein, Rolf: *See*—
Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,323,501, Cl. 260-333.000.

Dickerson, Robert B., to Container Corporation of America. Collapsible container. 4,323,188, Cl. 229-41.00R.

Dickey, Larry W., to Bell Telephone Laboratories, Incorporated. Reel holder having brake action. 4,323,206, Cl. 242-129.600.

Didek, Stanislav: *See*—
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.

Dieffenbacher, Albrecht, to Societe d'Assistance Technique pour Produits Nestle S.A. Coffee oil. 4,323,514, Cl. 260-412.300.

Diesel Kiki Co., Ltd.: *See*—
Chiyoda, Tsuneyuki; and Ohtani, Masami, 4,323,191, Cl. 236-44.00A.
Dietrich, Manfred: *See*—
Schmitz-Josten, Robert; Dietrich, Manfred; and Bomer, Bruno, 4,323,696, Cl. 560-220.000.
Dieulot, Gerard; Juan, Mathias; and Fardeau, Michel, to Societe d'Etude de Systems Avances et d'Amenagements. Unit particularly for taking stakes and possibly determining the winners in a game such as a national lotto game. 4,323,770, Cl. 235-375.000.
DiGiulio, Adolph V.; and Bauer, Jack N., to Atlantic Richfield Company. Rubber-modified fire-retardant anhydride copolymers. 4,323,655, Cl. 521-88.000.
Dines, Martin B.; and Chianelli, Russell R., to Exxon Research & Engineering Co. Method of preparing di and poly chalcogenides of group IVb, Vb, molybdenum and tungsten transition metals by low temperature precipitation from non-aqueous solution and the product obtained by said method. 4,323,480, Cl. 252-439.000.
Dion, Donald F., to RCA Corporation. Sequencer for power supply voltages. 4,323,789, Cl. 307-81.000.
Dischert, Robert A.; and Reitmeier, Glenn A., to RCA Corporation. Data rate reduction for digital video signals by subsampling and adaptive reconstruction. 4,323,916, Cl. 358-13.000.
Distler, Walter; and Kintopp, Erich, to Siemens Aktiengesellschaft. Tomographic apparatus for producing transverse layer images. 4,323,783, Cl. 250-445.00T.
Dixon, Roger C.: *See*—
Arnold, Victor F.; and Dixon, Roger C., 4,323,943, Cl. 361-114.000.
Dob, Allan M.: *See*—
Beckerman, Howard L.; and Dob, Allan M., 4,323,023, Cl. 112-158.00F.
Dochterman, Richard W., to General Electric Company. Motor mounting assembly including extendable band. 4,323,217, Cl. 248-604.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Soderberg, Richard; Winter, Steven; and Burst, Hermann, 4,323,274, Cl. 296-1.00S.
Doi, Hachiro, to Fuso Keigokin Co., Ltd. Lawn mower. 4,322,934, Cl. 56-11.100.
Dokoupil, Jiri: *See*—
Hacker, Kurt; and Dokoupil, Jiri, 4,322,900, Cl. 38-77.600.
Doles, Glenn P.: *See*—
den Toonder, Pieter; Doles, Glenn P.; Lund, John A.; Merrell, Richard G.; and Stubbs, Graham S., 4,323,922, Cl. 358-117.000.
Dombek, Bernard D., to Union Carbide Corporation. Production of methyl esters and ethylene glycol esters from reaction of carbon monoxide and hydrogen in presence of ruthenium catalyst. 4,323,513, Cl. 260-410.600.
Dome Petroleum Limited: *See*—
O'Rourke, J. Cam; Pilkington, G. Roger; and Bercha, Frank G., 4,323,322, Cl. 405-217.000.
Domes, E. A.; Taylor, Forrest C.; Vacval, Dusan M.; and Venere, Lawrence A., to International Harvester Company. Automatic tailgate for a dump truck. 4,323,279, Cl. 298-23.0DF.
Donaldson Company, Inc.: *See*—
Monson, Donald R.; and Camplin, Harry R., 4,323,369, Cl. 55-1.000.
Dorler, Jack A.: *See*—
Berndlmaier, Erich; Clark, Bernard T.; and Dorler, Jack A., 4,323,914, Cl. 357-82.000.
Dorma Glas GmbH & Co. KG: *See*—
Fuller, Herman, 4,323,382, Cl. 65-70.000.
Dorr-Oliver Incorporated: *See*—
Olear, John, 4,323,456, Cl. 210-529.000.
Douglas Equipment Manufacturing Co.: *See*—
Douglas, Huey, 4,322,858, Cl. 2-2.000.
Douglas, Huey, to Douglas Equipment Manufacturing Co. Protective garments for football players. 4,322,858, Cl. 2-2.000.
Dow Chemical Company, The: *See*—
Bradley, Norbert L.; Cleereman, Kenneth J.; and Wessling, Ritchie A., 4,323,531, Cl. 264-113.000.
Lowery, Kirby, Jr.; Birkelbach, Donald F.; and Shipley, Randall S., 4,323,665, Cl. 526-122.000.
Downey, Gale D.; and Lutz, Charles W., to FMC Corporation. Stabilized sodium sulfate-hydrogen peroxide-sodium chloride adduct and alkaline bleach composition containing same. 4,323,465, Cl. 252-102.000.
Downing, Philip A.: *See*—
Adams, Frederick J.; and Downing, Philip A., 4,322,986, Cl. 74-89.180.
Dowthwaite, Edwin; and Hiskens, Ian R., to Tenneco Chemicals, Inc. Paper sizing. 4,323,425, Cl. 162-168.00N.
Doyle, Keith G.: *See*—
Zollman, Peter M.; and Doyle, Keith G., 4,323,928, Cl. 358-299.000.
Drabert Sohne Minden (Ger. Body Corp.): *See*—
Riedel, Dieter, 4,323,407, Cl. 156-91.000.
Dreessen, Gerardus J. W.: *See*—
Buhring, Otto; Dreessen, Gerardus J. W.; Groeneveld, Jacob W. H.; Queck, Robert; Thome, Heinrich; and Willemsen, Gerrit J., 4,323,718, Cl. 373-73.000.
Dresser Industries, Inc.: *See*—
Young, James W., 4,323,128, Cl. 175-57.000.
Driver, George J., Jr. Laser-resistant warhead. 4,323,012, Cl. 102-489.000.
Dubost, Bruno; and Bouvaist, Jean, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Process for the thermal treatment of aluminium - copper - magnesium - silicon alloys. 4,323,399, Cl. 148-12.70A.
Duchin, Daniel. Tag dispenser for hand-held attacher. 4,323,183, Cl. 227-3.000.
Dugge, Richard H.; and Rollins, Dallas W., to ACF Industries, Incorporated. Combination vacuum relief valve and pressure relief valve which are protected from the atmosphere. 4,323,096, Cl. 137-350.000.
Dukes, James S.: *See*—
Loveland, William A.; Dukes, James S.; and Sparks, Gregory W., 4,323,251, Cl. 273-407.000.
Duley, Raymond S., to NCR Corporation. Analog-to-digital converter circuit. 4,323,886, Cl. 340-347.0AD.
Dunning, Stephen C.; and Sutherland, Joseph E., to International Telephone and Telegraph Corporation. Elastic storage and synchronization control apparatus for use in a telephone switching system. 4,323,790, Cl. 370-102.000.
Du Pont de Nemours, E. I., and Company: *See*—
Chen, Gwendyline Y. Y. T., 4,323,636, Cl. 430-271.000.
Chen, Gwendyline Y. Y. T.; and Brennan, James F., 4,323,637, Cl. 430-271.000.
Edwards, Donald W.; and Gorondy, Emery J., 4,323,904, Cl. 346-74.700.
Grantham, Gary D., 4,323,580, Cl. 424-324.000.
Hall, Laurence W.; and Overman, Joseph D., 4,323,645, Cl. 430-564.000.
Middleton, William J., 4,323,578, Cl. 424-298.000.
Nacci, George R., 4,323,929, Cl. 358-301.000.
Rellick, Joseph R., 4,323,483, Cl. 252-512.000.
Durand, Dianne R. Pleating and smocking machine. 4,323,021, Cl. 112-133.000.
Durandeau, Michel; Voisin, Norbert; and Verdier, Jean P., to Societe Nationale Industrielle Aerospatiale. Digital-analog interface for insertion between a digital control signal transmitter and a controlled moving element. 4,323,884, Cl. 340-347.0DA.
Durham, Rodney M.: *See*—
Baskins, Lowell L.; and Durham, Rodney M., 4,323,777, Cl. 250-339.000.
Durr, Dieter: *See*—
Pissiotas, Georg; Durr, Dieter; Rohr, Otto; and Lukaszczyk, Alfons, 4,323,388, Cl. 71-88.000.
Dury, Joseph D., Jr.: *See*—
Lansberry, John B.; Apt, Jerome, Jr.; and Dury, Joseph D., Jr., 4,323,280, Cl. 299-1.000.
Dustell LTEE: *See*—
Jolin, Marcel, 4,323,377, Cl. 55-341.0HM.
Dutra, Gerard A., to Monsanto Company. N-Thiolcarbonyl derivatives of N-phosphonomethylglycinonitrile esters, herbicidal compositions and use thereof. 4,323,387, Cl. 71-87.000.
Dykes, William E. Surfing footwear. 4,322,894, Cl. 36-114.000.
Dykman, Arkady S.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.
E & E Kaye Limited: *See*—
Plum, Douglas B., 4,323,218, Cl. 249-65.000.
E M I - Varian Limited: *See*—
Cutting, Alan B., 4,323,819, Cl. 315-39.610.
E. R. Squibb & Sons, Inc.: *See*—
Varma, Ravi K.; and Chao, Sam T., 4,323,511, Cl. 260-397.450.
E-Systems, Inc.: *See*—
Wilson, Lee E., 4,323,268, Cl. 285-41.000.
Easter, Finis C.: *See*—
Clark, Charles A., Jr.; and Easter, Finis C., 4,323,957, Cl. 363-21.000.
Eastman Kodak Company: *See*—
Columbus, Richard L., 4,323,536, Cl. 422-56.000.
Jadwin, Thomas A., 4,323,634, Cl. 430-110.000.
Levinson, Steven R., 4,323,642, Cl. 430-438.000.
Eaton Corporation: *See*—
Schutten, Herman P.; Jaskolski, Stanley V.; Spellman, Gordon B.; Lade, Robert W.; and Schutten, Michael J., 4,323,793, Cl. 307-252.00R.
Eavenson, Auchmuty & Greenwald: *See*—
Greenwald, Edward H., Sr.; Greenwald, Edward H., Jr.; and Bonci, Frederick R., 4,323,281, Cl. 299-1.000.
Eberhardt, Alfred F.: *See*—
Eberhardt, Timothy J., 4,323,324, Cl. 408-124.000.
Eberhardt, Timothy J., to Eberhardt, Alfred F.; and Coghill, Marvin, part interest to each. Chuck brake. 4,323,324, Cl. 408-124.000.
Ecker, Samuel: *See*—
Benjamin, Milton L.; Miles, Wilbur N.; and Ecker, Samuel, 4,322,990, Cl. 82-3.000.
Eckert, Josef. Dispenser utilizing a follower and delivery device for dispensing pastes, creams, etc. 4,323,175, Cl. 222-256.000.
Eckes, Helmut; Erckel, Rudiger; Martini, Thomas; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Novel stilbene compounds: process for their manufacture and their use as optical brighteners. 4,323,675, Cl. 542-463.000.
Edson, Donald A.; Johnson, Keith I.; and Scott, Michael H., to Welding Institute, The. Electrical inter-connection method. 4,323,759, Cl. 219-137.0PS.

Edwards, Donald W.; and Gorondy, Emery J., to Du Pont de Nemours, E. I., and Company. Magnetic printing process and apparatus. 4,323,904, Cl. 346-74.700.
Efflandt, James F., to Outboard Marine Corporation. Deflector member for a rotary lawn mower. 4,322,938, Cl. 56-320.200.
Egawa, Keiichi: *See*—
Chiba, Kazumasa; Egawa, Keiichi; and Muraki, Toshio, 4,323,639, Cl. 430-281.000.
Ehl, Klaus; and Deubel, Reinhold, to Hoechst Aktiengesellschaft. Process for the preparation of pigment formulations and their use. 4,323,396, Cl. 106-23.000.
Ehrenfreund, Josef, to Ciba-Geigy Corporation. Insecticidal N-(p-aminophenyl)-N'-benzoylureas. 4,323,579, Cl. 424-322.000.
Eibner, Jules A., to Sperry Corporation. Readback pulse compensator. 4,323,932, Cl. 360-45.000.
Eichrodt, Dieter; and Elsen, Friedhelm, to Siemens Aktiengesellschaft. Logic circuit arrangement in the integrated MOS-circuitry technique. 4,323,982, Cl. 364-786.000.
Eigemeier, Willi. Door lock with spring bolt and dead bolt. 4,322,958, Cl. 70-107.000.
Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, to Bayer Aktiengesellschaft. Esters of phosphorous acid. 4,323,501, Cl. 260-333.000.
Ekstrom Industries, Inc.: *See*—
Robinson, Darrell, 4,323,294, Cl. 339-19.000.
Elder, J. Calvin, to American Standard Inc. Manual block traffic control and signaling system for railroads. 4,323,210, Cl. 246-26.000.
Electro-Cap, Inc.: *See*—
Sams, Marvin W., 4,323,076, Cl. 128-644.000.
Eli Lilly and Company: *See*—
Suarez, Tulio; and Jones, C. David, 4,323,707, Cl. 564-324.000.
Elitex, koncern textilniho strojirenstvi: *See*—
Sraitr, Stanislav; and Srejberova, Hana, 4,322,944, Cl. 57-328.000.
Elmquist, Lyle F.: *See*—
Jones, Duane A.; and Elmquist, Lyle F., 4,323,487, Cl. 525-54.320.
Elsen, Friedhelm: *See*—
Eichrodt, Dieter; and Elsen, Friedhelm, 4,323,982, Cl. 364-786.000.
Embree, Milton L.; and Garrett, William G., to Bell Telephone Laboratories, Incorporated. Reciprocal current circuit. 4,323,797, Cl. 307-490.000.
Emery, Vernon V.: *See*—
Korff, Wolfram G.; Emery, Vernon V.; and Bond, Joseph K., 4,323,337, Cl. 425-155.000.
Emhart Industries, Inc.: *See*—
Sandler, Louis M.; Spofford, Walter R.; and Scott, Charles E., 4,323,861, Cl. 331-111.000.
Emmenthal, Klaus-Dieter; and Hagemann, Gunter, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine with an exhaust-driven turbocharger. 4,322,948, Cl. 60-602.000.
Endo, Yoshinori; and Yoshikawa, Masaaki, to Yamaha Hatsudoki Kabushiki Kaisha. Multi-cylinder internal combustion engine of fuel injection type. 4,323,041, Cl. 123-432.000.
Engel, Christopher M.; and Reneau, Daniel L., to Zenith Radio Corporation. Tint control. 4,323,917, Cl. 358-28.000.
Engel, Dusan J., to UOP Inc. Preparation of mono-tertiary butylhydroquinone. 4,323,713, Cl. 568-766.000.
Engel, Dusan J.; and Malloy, Thomas P., to UOP Inc. Preparation of mono-tertiary butylhydroquinone. 4,323,715, Cl. 568-766.000.
Engel, Dusan J.: *See*—
Malloy, Thomas P.; and Engel, Dusan J., 4,323,714, Cl. 568-766.000.
Engel, Stephen M.: *See*—
Creighton, Robert A.; and Engel, Stephen M., 4,323,897, Cl. 343-18.00E.
Engelhardt, Friedrich: *See*—
Brachten, Gert; Engelhardt, Friedrich; Helling, Heinz; and Ribka, Joachim, 4,323,363, Cl. 8-532.000.
English Electric Valve Company Limited: *See*—
Garfield, Brian R. C., 4,323,811, Cl. 313-99.000.
Enomoto, Shigeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing camera. 4,323,303, Cl. 354-25.000.
Enomoto, Tatsuya; and Shibata, Hiroshi, to VLSI Technology Research Association. Method for manufacturing semiconductor memory devices. 4,322,881, Cl. 29-571.000.
Entzmann, Karl, to Simmering-Graz-Pauker Aktiengesellschaft fur Maschinen-, Kessel-und Waggonbau. Process for activating treatment of crude oil. 4,323,448, Cl. 208-85.000.
Erckel, Rudiger: *See*—
Eckes, Helmut; Erckel, Rudiger; Martini, Thomas; and Rosch, Gunter, 4,323,675, Cl. 542-463.000.
Erikson, Herman E.: *See*—
Maltzman, Edward; and Erikson, Herman E., 4,323,349, Cl. 434-184.000.
Erikson Tool Company: *See*—
Benjamin, Milton L.; Miles, Wilbur N.; and Ecker, Samuel, 4,322,990, Cl. 82-3.000.
Ervin, Ron E.; and Belcher, Noble. Energy-temperature occupant monitor apparatus. 4,323,762, Cl. 219-482.000.
Erwin, William L.; and Chamness, Addison B., Jr. Engine fuel vaporizing device and system. 4,323,044, Cl. 123-557.000.
Esquire, Inc.: *See*—
Pustka, Marvin J., 4,323,956, Cl. 362-374.000.
Etablissement Public de Diffusion dit "Telediffusion de France": *See*—
Guillou, Louis C., 4,323,921, Cl. 358-114.000.
Etablissements Pellenc & Motte: *See*—
Pellenc, Roger, 4,323,269, Cl. 285-133.00R.
Etscherberg, Eugen: *See*—
Opitz, Wolfgang; Etscherberg, Eugen; Dell, Hans-Dieter; and Jacobi, Haireddin, 4,323,517, Cl. 260-455.00R.
Exxon Research & Engineering Co.: *See*—
Dines, Martin B.; and Chianelli, Russell R., 4,323,480, Cl. 252-439.000.
Eyelet Specialty Co., Inc.: *See*—
Idec, Eric J., 4,323,157, Cl. 206-385.000.
Ezekiel, Shaoul: *See*—
Leiby, Clare C., Jr.; and Ezekiel, Shaoul, 4,323,860, Cl. 372-32.000.
Ezis, Andre: *See*—
Samanta, Shyam K.; Subramanian, Krishnamoorthy; and Ezis, Andre, 4,323,325, Cl. 409-131.000.
F. L. Plastics Industries Pty. Ltd.: *See*—
Lenthall, Frank C., 4,322,902, Cl. 40-322.000.
Facet Enterprises, Inc.: *See*—
Mortensen, Harold R., 4,322,985, Cl. 74-6.000.
Shearin, Robert W., 4,323,379, Cl. 55-511.000.
Fairchild Camera & Instrument Corp.: *See*—
Vora, Madhukar D., 4,322,882, Cl. 29-571.000.
Faith, William N.: *See*—
Seitel, Steven C.; Porteus, James O.; and Faith, William N., 4,322,967, Cl. 73-15.600.
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, to Vyzkumny ustav bavlnarsky. Open-end spinning method and apparatus. 4,322,942, Cl. 57-411.000.
Fansteel Inc.: *See*—
Corey, Gerald D., 4,323,114, Cl. 165-78.000.
Fardeau, Michel: *See*—
Dieulot, Gerard; Juan, Mathias; and Fardeau, Michel, 4,323,770, Cl. 235-375.000.
Fass, Rudolf: *See*—
Hoyer, Ernst; Meininger, Fritz; and Fass, Rudolf, 4,323,497, Cl. 260-146.00T.
Fattinger, Volker: *See*—
Bentz, Rolf; and Fattinger, Volker, 4,323,372, Cl. 55-59.000.
Fauerskov, Svend E.; and Sjostrom, Svend O., to A/S Bruel & Kjaer. Strip chart recorder with a differential capacitor serving as position sensor in a position servo for the recording pen. 4,323,903, Cl. 346-32.000.
Feamster, William C., III. Canopy cutting device. 4,322,991, Cl. 82-4.00R.
Feldstein, Nathan. Colloidal dispersions for activating non-conductors prior to electroless plating. 4,323,594, Cl. 427-98.000.
Fenichel, Richard L.: *See*—
Wolf, Milton; and Fenichel, Richard L., 4,323,681, Cl. 544-323.000.
Ferlan, Stephen J.: *See*—
Schallenberger, John M.; Kmonk, Stanley; and Ferlan, Stephen J., 4,323,428, Cl. 376-353.000.
Ferland, Jean-Marie: *See*—
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, 4,323,572, Cl. 424-251.000.
Ferrantino, Stanislad: *See*—
Lagana', Vincenzo; Saviano, Francesco; and Ferrantino, Stanislad, 4,323,252, Cl. 277-12.000.
Ferrari, Ivano: *See*—
Grilli, Walter; Manicardi, Emidio; and Ferrari, Ivano, 4,323,185, Cl. 228-114.000.
Ferrini, Pier G.: *See*—
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,323,688, Cl. 548-330.000.
Ferris, Harold, to COS Electronics Corporation. Apparatus and method for controlling the application of therapeutic direct current to living tissue. 4,323,073, Cl. 128-419.00R.
Fichter, Manfred, to Kienzle Apparate GmbH. Device for erasing a record carrier recorded by magnetic fields in visually readable form. 4,323,933, Cl. 346-74.300.
Fiedler, Wayne; and Slobodzian, Gregory E., to Stewart-Warner Corporation. High resolution video display system. 4,323,896, Cl. 340-800.000.
Figini, Mario: *See*—
Demonte, Filippo; and Figini, Mario, 4,323,315, Cl. 400-63.000.
Finetex, Inc.: *See*—
Scala, Thomas L., Jr., 4,323,693, Cl. 560-103.000.
Scala, Thomas L., Jr., 4,323,694, Cl. 560-103.000.
Fischer, Karin: *See*—
Brunner, Heinrich; and Fischer, Karin, 4,323,970, Cl. 364-436.000.
Fish, Barry M.: *See*—
Witney, Gary; and Visser, Harry, 4,323,829, Cl. 318-55.000.
Fisher, Seth G.; and Kowalyshyn, Stephen, to United States of America, Navy. Torpedo steering control system. 4,323,025, Cl. 114-25.000.
Fisichella, Jeanne M. Medical face mask. 4,323,063, Cl. 128-139.000.
Fitzpatrick, Cecil C.; and Spurgat, Jimmy C., to Cooper Tire & Rubber Company. Valve stem bender and/or marker. 4,322,963, Cl. 72-387.000.
Fives-Cail Babcock: *See*—
Pietryka, Joseph, 4,323,107, Cl. 164-416.000.
Flasza, Michael D., to Zenith Radio Corporation. Automatic phase adjusting circuit for a synchronous detector. 4,323,924, Cl. 358-188.000.
Flax, Louis; and Brzezinski, Vincent, to Televault, Inc. Telephone locking device. 4,323,739, Cl. 179-189.00D.

Fleck, Wolfgang: *See*—
Stenzel, Wolfgang; Fleck, Wolfgang; Cohnen, Erich; and Armah, Ben, 4,323,570, Cl. 424-251.000.
Fleetwood Systems, Inc.: *See*—
Mojden, Wallace W., 4,323,150, Cl. 198-690.000.
Flesher, Richard H.; and Massie, Lewis E. Warehouse pallet. 4,323,016, Cl. 108-51.100.
Fletcher Sutcliffe Wild Limited: *See*—
Wake, Malcolm, 4,323,002, Cl. 91-25.000.
Flexi-Group Inc., The: *See*—
Bromberg, Howard M., 4,323,609, Cl. 428-65.000.
Florence, Noel S.; and Lynn, Norman, to Lightolier Incorporated. Moisture sealed vandal-resistant lighting fixture. 4,323,954, Cl. 362-267.000.
FMC Corporation: *See*—
Ball, Peter, 4,323,975, Cl. 364-559.000.
Baum, Jonathan S., 4,323,685, Cl. 546-300.000.
Downey, Gale D.; and Lutz, Charles W., 4,323,465, Cl. 252-102.000.
Harper, Bruce M.; Billett, Ronald J.; Roberts, Thomas E.; and Viitanen, Veikko K., 4,323,336, Cl. 425-126.00S.
Mucenieks, Paul R., 4,323,437, Cl. 204-98.000.
Ragan, Marshall P.; and Sytsma, Peter H., 4,323,141, Cl. 187-8.470.
Fontaine, Jean-Claude. Fuse cartridges. 4,323,872, Cl. 337-158.000.
Ford Motor Company: *See*—
Chattha, Mohinder S., 4,323,660, Cl. 525-161.000.
Maeroff, Bruce J., 4,323,166, Cl. 220-86.00R.
Samanta, Shyam K.; Subramanian, Krishnamoorthy; and Ezis, Andre, 4,323,325, Cl. 409-131.000.
Whitney, Douglas A., 4,323,093, Cl. 137-56.000.
Forg, Wolfgang: *See*—
Muller, Karl-Heinz; and Forg, Wolfgang, 4,323,380, Cl. 62-28.000.
Fork, Frank W.; and Kelly, Charles J., to H. H. Robertson Company. Surface mounted outlet unit. 4,323,723, Cl. 174-48.000.
Fortier, J. Paul. Excrement pickup device. 4,323,272, Cl. 294-1.0BA.
Foscarini, Anthony; Foscarini, John; and Comello, Corrado. Safety landing. 4,323,140, Cl. 182-128.000.
Foscarini, John: *See*—
Foscarini, Anthony; Foscarini, John; and Comello, Corrado, 4,323,140, Cl. 182-128.000.
Foulon, Raymond: *See*—
Meyer, Nicolas; and Foulon, Raymond, 4,323,667, Cl. 528-138.000.
Fowler, Paul J.; and Zum Bahlen, Ralph E., to Stenograph Corporation. Shorthand machine paper gauge. 4,323,316, Cl. 400-91.000.
Fowler, Steven E.; Hennings, George N.; Hibbs, Joseph E.; Redmond, Stephen L.; and Swenson, Richard M., to United States of America, Navy. Integral store suspension and communication device. 4,322,998, Cl. 89-1.50D.
Foxmar Industries Inc.: *See*—
Teich, Rudor M., 4,323,820, Cl. 315-86.000.
Fradenburgh, Evan A., to United Technologies Corporation. Hingeless helicopter rotor with elastic gimbal hub. 4,323,332, Cl. 416-134.00A.
Frahm, Veryl H., Jr.: *See*—
Kruesi, Paul R.; and Frahm, Veryl H., Jr., 4,323,390, Cl. 75-0.50A.
Framatome: *See*—
Marmorat, Andre; and Robert, Arnold-Michel, 4,323,750, Cl. 219-76.100.
Franklin Institute, The: *See*—
Belsterling, Charles A.; and Stone, John, 4,323,830, Cl. 318-158.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,323,013, Cl. 104-7.00B.
Freedman, Morris D.: *See*—
Whiteside, Arliss E.; Freedman, Morris D.; Tasar, Omur; and Rothschild, Alexander M., 4,323,966, Cl. 364-200.000.
Freiborg, Bennie. Asphalt composition shingles. 4,322,928, Cl. 52-521.000.
Freitag, Herbert; and Schnitzius, Klaus, to Stabilus GmbH. Gas spring with means for impeding piston movement away from one terminal position. 4,323,224, Cl. 267-64.120.
Fried, John H.; Kertesz, Denis J.; and Marx, Michael, to Syntex (U.S.A.) Inc. Esters of 6-chloro-11β, 17α,21-trihydroxypregna-1,4,6-triene-3,20-dione. 4,323,564, Cl. 424-241.000.
Friedrich, Ralph S.: *See*—
Dana, William R.; Friedrich, Ralph S.; and McKenney, John D., 4,323,408, Cl. 156-175.000.
Frieseke & Hoepfner GmbH: *See*—
Strobel, Heinrich, 4,322,971, Cl. 73-159.000.
Fritz, Frederick F., to Oxford Air Systems, Inc. Apparatus and method for cleaning air. 4,323,373, Cl. 55-96.000.
Fritzsche, Alfred K.; Holladay, Harry P.; and Woodcock, Maurice L., to Monsanto Company. Tube sheets for permeators. 4,323,454, Cl. 210-321.100.
Fromm, Ingrid, to Siemens Aktiengesellschaft. Optical device for measuring slight pressure differences by means of light intensity changes. 4,322,978, Cl. 73-705.000.
Fromm, Ingrid, to Siemens Aktiengesellschaft. Optical device for measuring slight differences of pressure by means of a change in light intensity. 4,322,979, Cl. 73-705.000.
Fu, Cherng-Chyi, to Syntex (U.S.A.) Inc. Contact lens cleaning, storing and wetting solutions. 4,323,467, Cl. 252-106.000.
Fu, Wallace Y.: *See*—
Ashworth, Robert W.; and Fu, Wallace Y., 4,323,516, Cl. 260-453.300.
Fuji Koeki Corporation: *See*—
Yakematsu, Yoshiyuki, 4,323,822, Cl. 315-241.00P.
Fuji Photo Film Co., Ltd.: *See*—
Mifune, Hiroyuki; Hirano, Shigeo; and Akimura, Yoshitaka, 4,323,643, Cl. 430-441.000.
Nakamura, Taku; Ogawa, Masasi; and Ishigaki, Kunio, 4,323,644, Cl. 430-518.000.
Ohnishi, Masahiro; and Kimura, Tsutomu, 4,323,906, Cl. 346-76.00L.
Oishi, Yasushi, 4,323,635, Cl. 430-217.000.
Fujii, Katsutoshi: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.
Fujii, Motoharu; Koumura, Noboru; Ayata, Naoki; Saito, Seiji; and Sato, Yasushi, to Canon Kabushiki Kaisha. Optical scanner for reading data recorded in plural colors. 4,323,919, Cl. 358-75.000.
Fujimori, Shinichiro: *See*—
Okushima, Hiromi; Fujimori, Shinichiro; Furuya, Rikizo; and Hayakawa, Shuzo, 4,323,500, Cl. 260-239.570.
Fujisawa, Kimio: *See*—
Nakamura, Kimio; Fujisawa, Kimio; and Ochiai, Kokichi, 4,323,837, Cl. 322-7.000.
Fujita, Takashi: *See*—
Kunieda, Toshiaki; Odagiri, Masaru; Fujita, Takashi; and Shinohara, Koichi, 4,323,629, Cl. 428-457.000.
Fujitsu Limited: *See*—
Andoh, Ikuhiro, 4,323,296, Cl. 339-217.00S.
Ogawa, Kazuo; Suzuki, Eiji; Kurita, Osamu; and Horikawa, Izumi, 4,323,864, Cl. 333-165.000.
Okamura, Eiji, 4,323,832, Cl. 318-341.000.
Fujiwara, Yoshio: *See*—
Watanabe, Masanao; Naito, Keiichi; Odajima, Tooru; and Fujiwara, Yoshio, 4,323,659, Cl. 525-108.000.
Fukami, Harukazu: *See*—
Kikumoto, Kyoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, 4,323,568, Cl. 424-250.000.
Fukazawa, Kazuo; and Yamada, Akira, to RCA Corporation. Video disc locked groove corrector. 4,323,998, Cl. 369-43.000.
Fukuda, Shuzo; and Ohkubo, Yutaka, to Nippon Kokan Kabushiki Kaisha. Continuous dip-plating process on one-side of steel strip. 4,323,604, Cl. 427-433.000.
Fukuda, Takashi: *See*—
Sawada, Susumu; Fukuda, Takashi; Tsuchiya, Katsuhiro; and Ito, Kazuo, 4,323,404, Cl. 148-148.000.
Fukui, Seiji, to Shimano Industrial Company, Limited. Coaster brake hub with a gear-transmission. 4,323,146, Cl. 192-6.00A.
Fuller, Herman, to Dorma Glas GmbH & Co. KG. Method of pressing glass articles, especially feet of glasses with integrally formed stems. 4,323,382, Cl. 65-70.000.
Funke, Maurice F.: *See*—
Holmes, Allen B.; Gehman, Stacy E.; and Funke, Maurice F., 4,323,991, Cl. 367-83.000.
Furjes, Emil; and Kecskes, Istvan, to Ozdi Kohaszati Uzemek. Tundish and process for casting from charge to charge in continuous steel foundry. 4,323,108, Cl. 164-488.000.
Furukawa Electric Co., Ltd., The: *See*—
Nishimura, Hiroshi; Monma, Tetsuo; Yoshida, Minoru; Kirimoto, Kazunari; Hayamizu, Yoshio; and Nagasawa, Toshio, 4,323,607, Cl. 219-213.000.
Furukawa, Yasuhiko: *See*—
Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, 4,323,626, Cl. 428-374.000.
Furuya, Kouhei: *See*—
Tanzawa, Kazuhiko; Iwado, Seigo; Tsujita, Yoshio; Kuroda, Masao; and Furuya, Kouhei, 4,323,648, Cl. 435-125.000.
Furuya, Rikizo: *See*—
Okushima, Hiromi; Fujimori, Shinichiro; Furuya, Rikizo; and Hayakawa, Shuzo, 4,323,500, Cl. 260-239.570.
Fuso Keigokin Co., Ltd.: *See*—
Doi, Hachiro, 4,322,934, Cl. 56-11.100.
Futatsumori, Koji: *See*—
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,323,488, Cl. 528-32.000.
GAF Corporation: *See*—
Wexler, Allan; Chakrabarti, Paritosh M.; and Brown, Michael J., 4,323,710, Cl. 568-315.000.
Gajjar, Jagdishchandra T., to General Electric Company. Method of, and apparatus for, inserting carrier frequency signal information onto distribution transformer primary winding. 4,323,882, Cl. 340-310.00R.
Gakh, Igor G.: *See*—
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Gakh, Igor G.; Parbuzina, Iraida L.; Savitsky, Evgeny M.; Polyakova, Viktoria P.; and Roshan, Natalia R., 4,323,708, Cl. 564-418.000.
Galibin, Nikolai V.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.
Gallagher, John J. Drag reducing structure to minimize vessel collision damage. 4,323,026, Cl. 114-219.000.
Galyan, Boris A.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galyan, Boris A., 4,323,752, Cl. 219-101.000.

Gander, Robert J., to Johnson & Johnson. Method of treating carcinogenesis. 4,323,581, Cl. 424-324.000.
Ganter, Wolfgang, to Gebruder Junghans GmbH. Electronic wristwatch having electric terminal contacts. 4,323,996, Cl. 368-88.000.
Garbo, Paul W. Cryogenic defoliation. 4,322,910, Cl. 47-1.700.
Garchinsky, John S., to Union Metal Manufacturing Company. Visual indicating system for tall pole carrier raising and lowing apparatus. 4,323,028, Cl. 116-285.000.
Garfield, Brian R. C., to English Electric Valve Company Limited. Streaking image tube with closely spaced photocathode, suppressor mesh, and accelerator mesh. 4,323,811, Cl. 313-99.000.
Garner, Henry C.; and McGee, Lawrence, to British Steel Corporation. Furnace electrode clamps. 4,323,717, Cl. 373-101.000.
Garolis, Joseph J. Power-operated gear-driven box wrench. 4,322,989, Cl. 81-57.130.
Garrett Corporation, The: *See*—
Byrne, Joe L.; Kobayashi, Robert J.; and Nancarrow, James H., 4,322,949, Cl. 60-606.000.
Garrett, William G.: *See*—
Embree, Milton L.; and Garrett, William G., 4,323,797, Cl. 307-490.000.
Gartner, Robert. Screw drive. 4,322,987, Cl. 74-424.80R.
Garzione, Michael. Multi-purpose gauge. 4,322,888, Cl. 33-178.00D.
Gaunt, Wilmer B., Jr.: *See*—
Carriere, Joseph F.; Gaunt, Wilmer B., Jr.; Landry, Joseph E.; and Spires, Dewayne A., 4,323,885, Cl. 340-347.0CC.
Gautier, Herve: *See*—
Maerfeld, Charles; and Gautier, Herve, 4,323,985, Cl. 365-157.000.
Gawler, Glenn B., to General Electric Company. Switching mode regulator. 4,323,840, Cl. 323-287.000.
GCA Corporation: *See*—
Goldsmith, Jeff M., 4,323,763, Cl. 219-497.000.
Gebeke, Charles D., to Minnesota Mining and Manufacturing Company. Latch assembly for a video tape cassette. 4,323,207, Cl. 242-198.000.
Gebhard, Albert W., to Gerico, Inc. Pendulum swing. 4,323,233, Cl. 272-86.000.
Gebr. Bode & Co.: *See*—
Heinrich, Siegfried, 4,322,912, Cl. 49-28.000.
Gebruder Junghans GmbH: *See*—
Ganter, Wolfgang, 4,323,996, Cl. 368-88.000.
Gebrueder Buehler A.G.: *See*—
Manser, Josef, 4,323,585, Cl. 426-394.000.
Geelan, Thomas C.: *See*—
Oberg, Robert E.; Stewart, Clarence E.; and Geelan, Thomas C., 4,323,313, Cl. 366-142.000.
Gehman, Stacy E.: *See*—
Holmes, Allen B.; Gehman, Stacy E.; and Funke, Maurice F., 4,323,991, Cl. 367-83.000.
Geisler, Alfred J., Jr. Mobile structure. 4,322,925, Cl. 52-143.000.
General Dynamics, Pomona Division: *See*—
Lasker, George; and Redman, Paul G., 4,322,984, Cl. 74-51.000.
General Electric Company: *See*—
Beers, Melvin D., 4,323,489, Cl. 524-788.000.
Brunelle, Daniel J., 4,323,668, Cl. 528-173.000.
Claybaker, LeRoy A., 4,323,412, Cl. 156-335.000.
Dochterman, Richard W., 4,323,217, Cl. 248-604.000.
Gajjar, Jagdishchandra T., 4,323,882, Cl. 340-310.00R.
Gawler, Glenn B., 4,323,840, Cl. 323-287.000.
Jamrus, Kenneth J., 4,323,427, Cl. 376-230.000.
Jaster, Heinz, 4,323,109, Cl. 165-1.000.
Olson, Daniel R., 4,323,597, Cl. 427-160.000.
Smith, Lowell S., 4,323,077, Cl. 128-660.000.
Sommers, Edward G., Jr.; and O'Connor, James G., 4,323,342, Cl. 431-66.000.
Steigerwald, Robert L., 4,323,962, Cl. 363-127.000.
Vohr, John H., 4,323,286, Cl. 308-160.000.
General Motors Corporation: *See*—
Hussey, James L.; Miller, Michael B.; and Staker, William C., Jr., 4,323,902, Cl. 343-903.000.
Savage, Jack W., 4,323,266, Cl. 280-707.000.
Sheridan, John J.; Schwartz, Allen K.; and Anderson, Willis H., 4,323,744, Cl. 200-153.0LB.
General Tire & Rubber Company, The: *See*—
Alt, Rudolph, 4,323,409, Cl. 156-219.000.
Geo. A. Hormel & Company: *See*—
Lunn, John G., 4,322,873, Cl. 17-21.000.
Geosource Inc.: *See*—
Coogler, John M., 4,323,994, Cl. 367-183.000.
Gerber, Dennis J., to Acrometal Products, Inc. Self-centering feed mechanism for an abrasive grinding machine. 4,322,919, Cl. 51-139.000.
Gerico, Inc.: *See*—
Gebhard, Albert W., 4,323,233, Cl. 272-86.000.
Gerlach, Horst W. A., to United States of America, Army. MIC Combiner using unmatched diodes. 4,323,855, Cl. 331-56.000.
Gerling, John E., to Jova Enterprises, Inc. Microwave heating method and apparatus. 4,323,746, Cl. 219-10.55F.
Gerstley, James G., to Rockwell International Corporation. Foil cooling system for high current density electron-beam pumped lasers. 4,323,858, Cl. 372-107.000.
Ghosh, Sambhunath, to Institute of Gas Technology. Gas production by accelerated in situ bioleaching of landfills. 4,323,367, Cl. 48-197.00A.
Giebel, Gerhard, to USM Corporation. Machine for lasting heel seat portions of shoes. 4,322,863, Cl. 12-12.500.
Gilliam, Dennis D. Method of forming electrical discharge machine tools. 4,322,922, Cl. 51-325.000.
Gillie, Raymond A., to Arvey Corporation. Telescopic carton assembly. 4,323,187, Cl. 229-34.00R.
Gilligan, William H., to United States of America, Navy. Polynitroethylthionocarbonates and method of preparation. 4,323,518, Cl. 260-455.00B.
Gilson, Dale P., to Kobe, Inc. Dual thrust bearing for a shaft. 4,323,285, Cl. 308-160.000.
Ginsburgh, Irwin; and Hall, Robert D., to Standard Oil Company (Indiana). Method for controlling underground combustion. 4,323,120, Cl. 166-251.000.
Ginsburgh, Irwin; and Hall, Robert D., to Standard Oil Company (Indiana). Method for controlling underground combustion. 4,323,121, Cl. 166-251.000.
Gintert, Dean W.; and Waksmunski, Raymond A., to PPG Industries, Inc. Nozzle arrangement for glass sheet tempering apparatus. 4,323,385, Cl. 65-351.000.
Giortz, Leif Heegaard: *See*—
Jacobsen, Leif V., 4,323,841, Cl. 324-51.000.
Gipp, Roland: *See*—
Mazanek, Jan; Gipp, Roland; Zollner, Robert; Seifert, Peter; Wagner, Kuuno; and Blahak, Johannes, 4,323,657, Cl. 521-116.000.
Girardin, Jean-Claude: *See*—
Caby, Jean-Claude; and Girardin, Jean-Claude, 4,323,805, Cl. 310-237.000.
Giraud, Andre, to Spin Physics, Inc. Dropout compensation circuitry. 4,323,934, Cl. 360-61.000.
Gladh, Arne I. L.; and Grondahl, Eric W., to Albany International Corp. High-elasticity press felt. 4,323,622, Cl. 428-230.000.
Glaese, Edna R. Jump reach physical training system. 4,323,234, Cl. 272-93.000.
Glassman, Donald; and Maier, Edward E., to United States Steel Corporation. Process for separating ammonia and acid gases from streams containing fixed ammonia salts. 4,323,430, Cl. 203-7.000.
Glatt, Werner; and Bauer, Kurt. Fluidized bed apparatus. 4,323,312, Cl. 366-102.000.
Glauner, Wolfgang: *See*—
Muller, Stefan; Thun, Gerhard; and Glauner, Wolfgang, 4,322,982, Cl. 73-861.220.
Glaxo Group Limited: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; MacKinnon, John W. M.; Judd, Duncan B.; and Carey, Linda, 4,323,566, Cl. 424-248.510.
Globe-Union Inc.: *See*—
Mahato, Basanta K.; and Laird, Edwin C., 4,323,470, Cl. 252-182.100.
Gneiding, Donald R., to Robertshaw Controls Company. Pressure responsive flow control apparatus for breathing system. 4,323,086, Cl. 137-495.000.
Goggin, Sharon R.: *See*—
Keches, Leonidas A.; Goggin, Sharon R.; Isaac, Edward J.; and Rogers, Ronald J., 4,323,247, Cl. 273-235.00R.
Golabek, Robert S., to United States of America, Army. Weapon cycle or shot counter. 4,322,966, Cl. 73-7.000.
Goldsmith, Bruce W., to Space Odyssey Ltd. Visual display apparatus for the display of the autonomic nervous system and musculature and spinal nerves and related method. 4,323,351, Cl. 434-274.000.
Goldsmith, Jeff M., to GCA Corporation. Parametric power controller. 4,323,763, Cl. 219-497.000.
Gonzalez, Joe. Automatic film de-splicer and winder. 4,323,201, Cl. 242-56.00R.
Goode, James W.; Penner, Wayne A.; Ray, Charles D.; and Nelson, Robert G., to Mobil Oil Corporation. Seismic exploration system. 4,323,990, Cl. 367-21.000.
Goodyear Tire & Rubber Company, The: *See*—
Hall, Robert E., 4,323,102, Cl. 152-175.000.
Gordon, Alan M.: *See*—
Balzer, Gerry C.; and Gordon, Alan M., 4,323,735, Cl. 179-99.0LC.
Gormley, Joseph V.: *See*—
Calawa, Arthur R.; Gormley, Joseph V.; and Manfra, Michael J., 4,323,422, Cl. 156-636.000.
Gorondy, Emery J.: *See*—
Edwards, Donald W.; and Gorondy, Emery J., 4,323,904, Cl. 346-74.700.
Gould Advance Limited: *See*—
Leach, John M., 4,323,845, Cl. 323-224.000.
Gould, Henry D., to Shasta Industries, Inc. Pool cleaning head with rotary pop-up jet producing element. 4,322,860, Cl. 4-490.000.
Gould Inc.: *See*—
Berdan, Betty L.; and King, William M., 4,323,632, Cl. 428-626.000.
Goupil, Jean-Jacques. Halogenohydrates of N,N-disubstituted derivatives of piperazine having anticariogenic properties. 4,323,550, Cl. 424-52.000.
Graco, Inc.: *See*—
Krohn, Duane D., 4,323,741, Cl. 200-81.90R.
Graham, John F.; and Holt, Richard R. D. Dyeing method. 4,323,361, Cl. 8-444.000.
Grantham, Gary D., to Du Pont de Nemours, E. I., and Company. Miticidal, fungicidal and ovicidal diphenylsulfenamides. 4,323,580, Cl. 424-324.000.
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., to Standard Oil Company. Process for the oxidation of olefins to aldehydes and acids. 4,323,703, Cl. 562-546.000.

Grasselli, Robert K.: *See*—
Hardman, Harley F.; Callahan, James L.; and Grasselli, Robert K., 4,323,520, Cl. 260-465.900.
Gray, Larry O., to Dana Corporation. Vehicle speed control circuit. 4,323,134, Cl. 180-176.000.
Green, Marshall S.: *See*—
Cowan, Wavell F.; Green, Marshall S.; and McGurk, Stanley E., 4,323,426, Cl. 162-398.000.
Green, Martin A., to Unisearch Limited. Integrated solar cells and shunting diodes. 4,323,719, Cl. 136-249.000.
Greenfield, George B. Apparatus and method for enhancing radiographs. 4,323,973, Cl. 364-515.000.
Greenwald, Edward H., Jr.: *See*—
Greenwald, Edward H., Sr.; Greenwald, Edward H., Jr.; and Bonci, Frederick R., 4,323,281, Cl. 299-1.000.
Greenwald, Edward H., Sr.; Greenwald, Edward H., Jr.; and Bonci, Frederick R., to Eavenson, Auchmuty & Greenwald. Method of surface mining. 4,323,281, Cl. 299-1.000.
Greenway, John M.; and Bylund, Don M., to Milliken Research Corporation. Method and apparatus for temperature control of heated fluid in a fluid handling system. 4,323,760, Cl. 219-364.000.
Greis, Howard A., to Kinefac Corp. Die rolling machine. 4,322,961, Cl. 72-95.000.
Grilli, Walter; Manicardi, Emidio; and Ferrari, Ivano, to Italtractor I.T.M. S.p.A. Friction welding process for making hollow bodies such as rollers and similar articles. 4,323,185, Cl. 228-114.000.
Groeger, Heinz K.: *See*—
Malthouse, Martin D.; and Groeger, Heinz K., 4,323,416, Cl. 156-521.000.
Groeneveld, Jacob W. H.: *See*—
Buhring, Otto; Dreessen, Gerardus J. W.; Groeneveld, Jacob W. H.; Queck, Robert; Thome, Heinrich; and Willemsen, Gerrit J., 4,323,718, Cl. 373-73.000.
Grollier, Jean-Francois; and Allec, Josiane, to L'Oreal. Make-up remover composition for the face and eyes. 4,323,468, Cl. 252-174.170.
Gromov, Valery V.: *See*—
Shirinian, Vram T.; Mnatsakanov, Suren S.; Pavljuchenko, Valery N.; Rozenberg, Mark E.; Gromov, Valery V.; and Ivanchev, Sergei S., 4,323,666, Cl. 526-329.000.
Grondahl, Eric W.: *See*—
Gladh, Arne I. L.; and Grondahl, Eric W., 4,323,622, Cl. 428-230.000.
Gruber, Peter: *See*—
Voss, Gunther; and Gruber, Peter, 4,323,530, Cl. 264-109.000.
Grudno, Hans-Dieter, to Krupp Polysius AG. Apparatus for heat treating fine-grain material. 4,323,344, Cl. 432-106.000.
Grueneberg, Bevan E., to Pioneer Container Corp. Battery container. 4,323,156, Cl. 206-333.000.
Gruner, Ronald H., to Data General Corporation. CPU Employing micro programmable control for use in a data processing system. 4,323,964, Cl. 364-200.000.
Gryaznov, Vladimir M.: *See*—
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Gakh, Igor G.; Parbuzina, Iraida L.; Savitsky, Evgeny M.; Polyakova, Viktoria P.; and Roshan, Natalia R., 4,323,708, Cl. 564-418.000.
Grychtol, Klaus: *See*—
Degen, Hans-Juergen; and Grychtol, Klaus, 4,323,362, Cl. 8-506.000.
GTE Products Corporation: *See*—
Roche, William J.; and Bessone, Carlo S., 4,323,824, Cl. 315-289.000.
GTE Service Corporation: *See*—
Wyner, Elliot F.; and Lowry, Elvery D., 4,323,812, Cl. 313-198.000.
Guenter, Erwin, to Maag Gear-Wheel & Machine Co. Ltd. Testing apparatus for involute and helical gear teeth. 4,322,889, Cl. 33-179.50R.
Guigan, Jean. Dispenser for dispensing frozen goods. 4,323,169, Cl. 221-124.000.
Guillou, Louis C., to Etablissement Public de Diffusion dit "Telediffusion de France"; and L'Etat Francais, represente par le Secretaire d'Etat aux Poste et Telecommunications (Centre National d'Etudes des Telecommunications). System for transmitting information provided with means for controlling access to the information transmitted. 4,323,921, Cl. 358-114.000.
Gulati, Suresh T., to Corning Glass Works. Ceramic honeycomb structure. 4,323,614, Cl. 428-116.000.
Gulf Research & Development Company: *See*—
Tsai, Shirley C.; and McIlvried, Howard G., III, 4,323,447, Cl. 208-8.0LE.
Gulf & Western Corporation: *See*—
Pavone, Robert J., 4,323,149, Cl. 198-471.000.
Gulf & Western Manufacturing Company: *See*—
Andrews, Ralph L., 4,323,151, Cl. 198-740.000.
Gunson S.A. (Proprietary) Limited: *See*—
Wolf, Peter, 4,323,159, Cl. 209-548.000.
Guritz, Kenneth E.; and Guritz, Michael L. Service cable distribution system. 4,323,949, Cl. 361-428.000.
Guritz, Michael L.: *See*—
Guritz, Kenneth E.; and Guritz, Michael L., 4,323,949, Cl. 361-428.000.
Guttman, Milton. Protective means for door and window openings. 4,323,104, Cl. 160-92.000.
H. H. Robertson Company: *See*—
Fork, Frank W.; and Kelly, Charles J., 4,323,723, Cl. 174-48.000.
Haag, Werner O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Resin-metal compound complex for catalyzing chemical reactions. 4,323,698, Cl. 560-233.000.
Haavik, Harold K., to Nash Engineering Company, The. Two stage liquid ring pump. 4,323,334, Cl. 417-68.000.
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, to Ciba-Geigy Corporation. Benzimidazole-2-carboxylic acid and derivatives thereof. 4,323,688, Cl. 548-330.000.
Hachino, Hiroaki: *See*—
Suzuki, Seikou; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Hachino, Hiroaki; and Takahashi, Minoru, 4,322,980, Cl. 73-727.000.
Hacker, Kurt; and Dokoupil, Jiri. Ironing device for industrial use and associated iron. 4,322,900, Cl. 38-77.600.
Haddock, William H., to North Carolina State University. Method and apparatus for planting seedlings. 4,323,019, Cl. 111-2.000.
Hafele, Joseph C.: *See*—
Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., 4,323,401, Cl. 148-39.000.
Hagemann, Gunter: *See*—
Emmenthal, Klaus-Dieter; and Hagemann, Gunter, 4,322,948, Cl. 60-602.000.
Hagen, Remon: *See*—
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,323,682, Cl. 544-353.000.
Hagen, Rolf: *See*—
Bergman, Ola; Hagen, Rolf; Harenberg, Juergen; and Steiner, Herbert, 4,323,728, Cl. 178-3.000.
Hagihara, Tadashi. Array of filter elements. 4,323,451, Cl. 210-160.000.
Hahnkamm, Volker: *See*—
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,323,596, Cl. 427-127.000.
Hakamada, Isao: *See*—
Kawamura, Naoto; Masegi, Koichi; Hakamada, Isao; Uchiyama, Haruo; Kitamura, Takashi; and Ishii, Masaaki, 4,323,297, Cl. 350-6.800.
Halbach & Braun: *See*—
Braun, Ernst; and Braun, Gert, 4,323,282, Cl. 299-43.000.
Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil, 4,323,697, Cl. 560-232.000.
Halfon, Leon. Fish tank and aquarium. 4,323,032, Cl. 119-5.000.
Hall, Laurence W.; and Overman, Joseph D., to Du Pont de Nemours, E. I., and Company. Organic halogen compounds for negative-working silver halide emulsions. 4,323,645, Cl. 430-564.000.
Hall, Robert D.: *See*—
Ginsburgh, Irwin; and Hall, Robert D., 4,323,120, Cl. 166-251.000.
Ginsburgh, Irwin; and Hall, Robert D., 4,323,121, Cl. 166-251.000.
Hall, Robert E., to Goodyear Tire & Rubber Company, The. Dirt seal for removable rubber belts. 4,323,102, Cl. 152-175.000.
Hall, Rosemary J.: *See*—
West, Robert N.; West, Patricia A.; Barker, Andrew J.; and Hall, Rosemary J., 4,323,311, Cl. 356-431.000.
Hall, William F.: *See*—
De Wames, Roger E.; Hall, William F.; Ho, William W.; and Lim, Teong C., 4,323,901, Cl. 343-754.000.
Halvorsen, Norrine M. Independent insole assembly. 4,322,893, Cl. 36-43.000.
Hamilton, Joel A. Actuating stamp with free-turning inking roller. 4,323,011, Cl. 101-305.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Selective printing apparatus. 4,323,010, Cl. 101-110.000.
Hammann, Ingeborg: *See*—
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,323,571, Cl. 424-251.000.
Hammond, Ogden H., to Massachusetts Institute of Technology. Gasification of coal. 4,323,368, Cl. 48-202.000.
Hane, Teruaki: *See*—
Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, 4,323,626, Cl. 428-374.000.
Hanna Mining Company, The: *See*—
Jardine, Colin D.; Chong, Sooi; Coles, Rodney H.; and Hebb, Stephen, 4,323,199, Cl. 241-284.000.
Hansen, Christian B., to Danfoss A/S. Distributor valve for hydraulic planetary piston machine. 4,323,335, Cl. 418-61.00B.
Hansen, Erik Steinmann: *See*—
Jacobsen, Leif V., 4,323,841, Cl. 324-51.000.
Hansen, Niels H. V.; Mikkelsen, Erling H.; and Vissing, Soren, to P. Campen Maskinfabrik A/S. Method of producing foam material and apparatus therefor. 4,323,474, Cl. 252-307.000.
Hanson, Steven P.; Morrison, Howard J.; and Montague, Douglas P., to Marvin Glass & Associates. Electrical board game device. 4,323,243, Cl. 273-153.00S.
Hanyu, Susumu; and Kato, Kenji, to Janome Sewing Machine Co. Ltd. Pattern selecting system for electronic sewing machine. 4,323,022, Cl. 112-158.00E.
Hara, Hiroto: *See*—
Kikumoto, Kyoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, 4,323,568, Cl. 424-250.000.
Hara, Toyoji: *See*—
Sato, Tadashi; Hara, Toyoji; and Tomita, Tadashi, 4,323,787, Cl. 307-38.000.
Haraszti, Tegze P., to Rockwell International Corporation. Radiation hardened MOS voltage generator circuit. 4,323,846, Cl. 323-311.000.
Harayama, Takeo: *See*—
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba,

Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.

Hardman, Harley F.; Callahan, James L.; and Grasselli, Robert K., to Standard Oil Co., The. Preparation of methacrylic derivatives from tertiary-butyl-containing compounds. 4,323,520, Cl. 260-465.900.

Hardman, Harley F.: *See*—
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,323,703, Cl. 562-546.000.

Harenberg, Juergen: *See*—
Bergman, Ola; Hagen, Rolf; Harenberg, Juergen; and Steiner, Herbert, 4,323,728, Cl. 178-3.000.

Harper, Bruce M.; Billett, Ronald J.; Roberts, Thomas E.; and Viitanen, Veikko K., to FMC Corporation. Inserting sticks into confections. 4,323,336, Cl. 425-126.00S.

Harper, George S., to North American Philips Controls Corp. Setting mechanism for snap action circuit breaker. 4,323,868, Cl. 335-38.000.

Harreus, Albrecht: *See*—
Zimmermann, Wolfgang; and Harreus, Albrecht, 4,323,492, Cl. 524-388.000.

Harris Corporation: *See*—
Hershberger, David L., 4,323,731, Cl. 179-1.0GS.

Harris, Loren A. Burner apparatus. 4,323,017, Cl. 110-110.000.

Hartman, Adrian R.; Scott, Robert S.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. Solid-state protector circuitry using gated diode switch. 4,323,942, Cl. 361-56.000.

Hartmann, Albert: *See*—
Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, 4,323,560, Cl. 424-177.000.

Hasegawa, Masayasu; Nishikawa, Hideo; and Yoshida, Kayoko, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Antibacterial and antifungal composition. 4,323,565, Cl. 424-246.000.

Hasegawa, Takanori; Shimada, Takanobu; Sato, Takao; Kera, Masakazu; Yoshida, Shuntaro; and Shimoyama, Shinichi, to Riso Kagaku Corporation. Divided exposure method and device. 4,323,775, Cl. 250-317.100.

Hasegawa, Yasuyuki, to Shibuya Kogyo Company, Ltd. Pattern controlling device for laser marker. 4,323,317, Cl. 400-118.000.

Hasegawa, Yugo: *See*—
Sakata, Kenji; Yamada, Toshiaki; Uchiyama, Kenji; and Hasegawa, Yugo, 4,323,600, Cl. 427-202.000.

Hashimoto, Isao; and Nambu, Hirohiko, to Mitsui Petrochemical Industries, Ltd. Polyalkylhydroxychromene and process for preparing the same. 4,323,505, Cl. 260-345.200.

Hattori, Masumi; Ishida, Toru; and Tanaka, Shinichi, to Matsushita Electric Industrial Co., Ltd. Glaze resistor composition. 4,323,484, Cl. 252-521.000.

Hauni-Werke Korber & Co. KG.: *See*—
Helms, Adolf; and Lorenzen, Heinz-Christen, 4,323,082, Cl. 131-281.000.

Hauserman Ltd.: *See*—
Ball, Douglas C., 4,323,291, Cl. 312-194.000.

Hayakawa, Shuzo: *See*—
Okushima, Hiromi; Fujimori, Shinichiro; Furuya, Rikizo; and Hayakawa, Shuzo, 4,323,500, Cl. 260-239.570.

Hayamizu, Yoshio: *See*—
Nishimura, Hiroshi; Monma, Tetsuo; Yoshida, Minoru; Kirimoto, Kazunari; Hayamizu, Yoshio; and Nagasawa, Toshio, 4,323,607, Cl. 219-213.000.

Hayes, Robert S., to Mohawk Data Sciences Corp. Deflection system with positive feedback. 4,323,825, Cl. 315-387.000.

Hazemeijer B. V.: *See*—
Lipperts, Joseph H., 4,323,590, Cl. 427-38.000.

Healy, Kenneth T. Entrance for a beehive. 4,322,861, Cl. 6-4.00R.

Hebb, Stephen: *See*—
Jardine, Colin D.; Chong, Sooi; Coles, Rodney H.; and Hebb, Stephen, 4,323,199, Cl. 241-284.000.

Heggebo, Trygve; and Conradsen, Arne, to Norsk Hydro a.s. Method of manufacturing NP- or NPK-containing fertilizers from magnesium containing phosphate. 4,323,386, Cl. 71-35.000.

Heilmeier & Weinlein, Fabrik fur Oel-Hydraulik GmbH & Co. KG: *See*—
Brunner, Rudolf, 4,323,087, Cl. 137-625.680.

Heimlich, Henry J. Collapsible respiratory exerciser. 4,323,078, Cl. 128-728.000.

Heinrich, Siegfried, to Gebr. Bode & Co. Safety device for a vehicle door actuated by a turnable shaft. 4,322,912, Cl. 49-28.000.

Heinz, Lothar: *See*—
Tombaugh, Dennis; Martinsen, Nick; Symmons, Edgar B.; and Heinz, Lothar, 4,323,780, Cl. 250-419.000.

Helling, Heinz: *See*—
Brachten, Gert; Engelhardt, Friedrich; Helling, Heinz; and Ribka, Joachim, 4,323,363, Cl. 8-532.000.

Helms, Adolf; and Lorenzen, Heinz-Christen, to Hauni-Werke Korber & Co. KG. Apparatus for making holes in webs of wrapping material for cigarettes or the like. 4,323,082, Cl. 131-281.000.

Helwerth, Rainer; and Lorke, Horst, to Hoechst Aktiengesellschaft. Anticorrosive agent for aluminium and aluminium alloys. 4,323,476, Cl. 252-389.00R.

Henderson, Alva E.: *See*—
Wiggins, Richard H.; and Henderson, Alva E., 4,323,732, Cl. 179-1.0SM.

Henkel Corporation: *See*—
Jones, Duane A.; and Elmquist, Lyle F., 4,323,487, Cl. 525-54.320.

Henning, William J. Articles having an insulative coating containing kaolin and staple fibers. 4,323,400, Cl. 428-36.000.

Hennings, George N.: *See*—
Fowler, Steven E.; Hennings, George N.; Hibbs, Joseph E.; Redmond, Stephen L.; and Swenson, Richard M., 4,322,998, Cl. 89-1.50D.

Henrick, Clive A., to Zoecon Corporation. Cis and trans isomers of α-methyl(6-phenoxy-2-pyridyl)methyl-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylates and derivatives thereof. 4,323,574, Cl. 424-263.000.

Herchenbach, Horst; Ramesohl, Hubert; and Brachthauser, Kunibert, to Klockner-Humboldt-Deutz AG. Method and apparatus for the thermal treatment of fine-grained material with hot gases. 4,323,397, Cl. 106-100.000.

Hercules Incorporated: *See*—
Bolleter, William T.; and Chandler, Carl D., Jr., 4,323,669, Cl. 536-38.000.

Herkules AG: *See*—
Weick, Heinz H., 4,323,165, Cl. 215-320.000.

Herrington, Daniel R.; and Schwerko, Albert P., to Standard Oil Company, The. Process for the manufacture of furan compounds. 4,323,508, Cl. 260-346.110.

Hershberger, David L., to Harris Corporation. Variable-angle, multiple channel amplitude modulation system. 4,323,731, Cl. 179-1.0GS.

Hess, George M.; and Zils, James A., to Russell, Burdsall & Ward Corporation. Roller side bearing mounting system and method. 4,323,015, Cl. 105-199.0CB.

Hester, Richard E., to Control Data Corporation. Temperature compensated current source. 4,323,854, Cl. 330-256.000.

Hetzler, John C.: *See*—
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.

Hewett, Thomas A.: *See*—
McCullough, Robert W.; and Hewett, Thomas A., 4,323,053, Cl. 126-441.000.

Hewlett-Packard Company: *See*—
Check, Kenneth A., 4,323,959, Cl. 363-40.000.

Hibbs, Joseph E.: *See*—
Fowler, Steven E.; Hennings, George N.; Hibbs, Joseph E.; Redmond, Stephen L.; and Swenson, Richard M., 4,322,998, Cl. 89-1.50D.

Hickman, John S.; Olson, John B.; and Jeanson, Richard L., to Utility Products, a division of Reliable Electric Co. Telephone enclosure assembly and directory holder apparatus. 4,323,290, Cl. 312-100.000.

Hicks, Floyd E.: *See*—
Stewart, Charles G.; Stewart, Nellie R.; Hicks, Floyd E.; and Hicks, Maxine, 4,323,240, Cl. 273-85.00R.

Hicks, Maxine: *See*—
Stewart, Charles G.; Stewart, Nellie R.; Hicks, Floyd E.; and Hicks, Maxine, 4,323,240, Cl. 273-85.00R.

Higgins, Irving J., to Imperial Chemical Industries Limited. Biotransformations using methane-utilizing bacteria. 4,323,649, Cl. 435-136.000.

Hilbush, Edward O., III, to Rubco Products, Inc. Method for sealing pipe joints. 4,323,526, Cl. 264-36.000.

Hill, Charles S. Fluid braked planetary transmission. 4,322,988, Cl. 74-774.000.

Hill, Robert E., to Koppers Company, Inc. Acid copper chromate concentrates. 4,323,477, Cl. 252-397.000.

Hill, William F., to Lucas Industries Limited. Control circuit for an electromagnet. 4,323,944, Cl. 361-152.000.

Hiller, Heinrich: *See*—
Hoch, Helmut; and Hiller, Heinrich, 4,323,510, Cl. 260-367.000.

Himmelmann, Wolfgang: *See*—
Bergthaller, Peter; Himmelmann, Wolfgang; and Sobel, Johannes, 4,323,646, Cl. 430-622.000.

Himmer, Robert D. Automatic door for pets. 4,322,913, Cl. 49-168.000.

Hinson, Virgil H.: *See*—
Jarman, Davis R.; and Hinson, Virgil H., 4,322,890, Cl. 33-288.000.

Hioka, Minoru: *See*—
Tanaka, Yoshinobu; Ogawa, Koichi; and Hioka, Minoru, 4,323,455, Cl. 210-321.200.

Hira, Kazumi; and Tasho, Masao, to Nissan Motor Company, Limited. Vehicle roof structure. 4,323,276, Cl. 296-214.000.

Hirai, Masahide: *See*—
Uejima, Hiroyuki; Hirai, Masahide; and Sakaida, Tsutomu, 4,323,458, Cl. 210-688.000.

Hirai, Tadaaki: *See*—
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.

Hirakawa, Hiroshi: *See*—
Ahagon, Asahiro; Misawa, Makoto; Miyasaka, Kazuo; and Hirakawa, Hiroshi, 4,323,485, Cl. 525-237.000.

Hirano, Shigeo: *See*—
Mifune, Hiroyuki; Hirano, Shigeo; and Akimura, Yoshitaka, 4,323,643, Cl. 430-441.000.

Hisada, Hideo: *See*—
Okajima, Mutsuo; and Hisada, Hideo, 4,323,195, Cl. 239-215.000.

Hisatake, Michio: *See*—
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, 4,323,833, Cl. 318-376.000.

Hiskens, Ian R.: *See*—
Dowthwaite, Edwin; and Hiskens, Ian R., 4,323,425, Cl. 162-168.00N.

Hitachi Chemical Company, Ltd.: *See*—
Mukoyama, Yoshiyuki; and Chikazumi, Nobutoshi, 4,323,664, Cl. 526-88.000.
Hitachi, Ltd.: *See*—
Akitomo, Nobuo; and Tohyama, Shigeo, 4,323,309, Cl. 356-319.000.
Kobayashi, Toshio; and Oi, Tetsu, 4,323,418, Cl. 156-617.0SP.
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.
Matsuyama, Iwao; Susa, Kenzo; Suganuma, Tsuneo; Satoh, Shin; Katsuyama, Toshio; and Obayashi, Hidehito, 4,323,381, Cl. 65-32.000.
Saita, Shigeaki; and Nakaoka, Manabu, 4,323,225, Cl. 269-43.000.
Suzuki, Seikou; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Hachino, Hiroaki; and Takahashi, Minoru, 4,322,980, Cl. 73-727.000.
Hitomi, Kiyoshi: *See*—
Nakanishi, Teruyuki; and Hitomi, Kiyoshi, 4,322,962, Cl. 72-234.000.
Ho, William W.: *See*—
De Wames, Roger E.; Hall, William F.; Ho, William W.; and Lim, Teong C., 4,323,901, Cl. 343-754.000.
Hoch, Helmut; and Hiller, Heinrich, to BASF Aktiengesellschaft. Brown vat dye and its preparation. 4,323,510, Cl. 260-367.000.
Hockerson, Stan. Stabilized athletic shoe. 4,322,895, Cl. 36-129.000.
Hoechst Aktiengesellschaft: *See*—
Buhring, Otto; Dreessen, Gerardus J. W.; Groeneveld, Jacob W. H.; Queck, Robert; Thome, Heinrich; and Willemsen, Gerrit J., 4,323,718, Cl. 373-73.000.
Eckes, Helmut; Erckel, Rudiger; Martini, Thomas; and Rosch, Gunter, 4,323,675, Cl. 542-463.000.
Ehl, Klaus; and Deubel, Reinhold, 4,323,396, Cl. 106-23.000.
Helwerth, Rainer; and Lorke, Horst, 4,323,476, Cl. 252-389.00R.
Hoyer, Ernst; Meininger, Fritz; and Fass, Rudolf, 4,323,497, Cl. 260-146.00T.
Knorr, Harald, 4,323,705, Cl. 564-151.000.
Kraus, Helmut; Weinlich, Jurgen; and Plewan, Otto, 4,323,661, Cl. 525-259.000.
Muck, Karl-Friedrich; Sextro, Gunter; and Burg, Karlheinz, 4,323,502, Cl. 260-340.000.
Zimmermann, Wolfgang; and Harreus, Albrecht, 4,323,492, Cl. 524-388.000.
Hoefert, Reimar, to U.S. Philips Corporation. Arithmetic element based on the DDA principle. 4,323,978, Cl. 364-702.000.
Hoehn, Wolfgang, to ITT Industries, Inc. Bias voltage generator for a monolithic integrated circuit. 4,323,794, Cl. 307-296.00R.
Hoenig, Richard J.; and Klinikowski, James J., to Puritan-Bennett Corporation. Volume ventilator. 4,323,064, Cl. 128-204.210.
Hoffmann-La Roche Inc.: *See*—
Lukac, Teodor; Widmer, Erich; and Zell, Reinhard, 4,323,711, Cl. 568-347.000.
Hoffmuller, Wilhelm; Rossmann, Axel; and Schreiber, Franz, to Motoren-und Turbinen-Union Munchen GmbH. Method for manufacturing turborotors such as gas turbine rotor wheels, and wheel produced thereby. 4,323,394, Cl. 75-208.00R.
Hofmann, Albert, to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung. Control of cooling of superconducting rotor. 4,323,800, Cl. 310-52.000.
Hojo, Yoshikata: *See*—
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.
Hokkaido Sugar Co., Ltd.: *See*—
Iwasaki, Yosimi, 4,323,018, Cl. 110-208.000.
Holahan, Edward T.; and Meyer, Burton C., to Marvin Glass & Associates. Toy food processor. 4,322,909, Cl. 46-14.000.
Holladay, Harry P.: *See*—
Fritzsche, Alfred K.; Holladay, Harry P.; and Woodcock, Maurice L., 4,323,454, Cl. 210-321.100.
Holland, Hans J.; and Megles, John E., Jr., to Corning Glass Works. Inhibiting crystallization of opal glass compositions. 4,323,653, Cl. 501-32.000.
Hollmann, Bernd, to Claas OHG. Harvester with internal metal detector. 4,322,937, Cl. 56-10.200.
Holloway, Peter R.; and Mercer, Douglas A., to Analog Devices, Incorporated. Bias current network for IC digital-to-analog converters and the like. 4,323,795, Cl. 307-297.000.
Holmes, Allen B.; Gehman, Stacy E.; and Funke, Maurice F., to United States of America, Army. Fluidic mud pulser. 4,323,991, Cl. 367-83.000.
Holt, Richard R. D.: *See*—
Graham, John F.; and Holt, Richard R. D., 4,323,361, Cl. 8-444.000.
Holtz, Earl B.; Lay, Roger F.; Manduley, Flavio M.; and Moody, Howard J., to Pitney Bowes Inc. Power failure memory support system. 4,323,987, Cl. 365-229.000.
Holtzman, Barry L.: *See*—
Mercier, George E.; Pickett, John H.; and Holtzman, Barry L., 4,323,948, Cl. 361-315.000.
Homeyer, Bernhard: *See*—
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,323,571, Cl. 424-251.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Miyazawa, Takeshi; and Ono, Naotoshi, 4,322,896, Cl. 37-43.00E.
Honda, Keisuke: *See*—
Schaer, Glenn R.; Touyama, Tasuku; Yamamoto, Teruaki; Honda, Keisuke; and Wada, Tatsuo, 4,323,441, Cl. 204-224.00R.
Honda, Masakazu: *See*—
Suzuki, Yukitomo; and Honda, Masakazu, 4,323,098, Cl. 144-2.00R.
Honda, Takeo: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.
Honda, Tsuneo; Nishina, Haruo; and Uehara, Shuichi, to Toho Aen Kabushiki Kaisha. Process for recovering zinc. 4,323,391, Cl. 75-14.000.
Honeywell Information Systems Inc.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Moore, Dana, 4,323,965, Cl. 364-200.000.
Nowell, John R., 4,323,958, Cl. 363-28.000.
Peters, Arthur; Negi, Virendra S.; Cushing, David E.; Brown, Richard P.; and Joyce, Thomas F., 4,323,967, Cl. 364-200.000.
Hoover, Jack W. Spent solvent purification apparatus. 4,323,429, Cl. 202-83.000.
Horikawa, Izumi: *See*—
Ogawa, Kazuo; Suzuki, Eiji; Kurita, Osamu; and Horikawa, Izumi, 4,323,864, Cl. 333-165.000.
Horner Industries: *See*—
Horner, Larry D., 4,323,138, Cl. 181-147.000.
Horner, Larry D., to Horner Industries. Automotive loud speaker enclosure. 4,323,138, Cl. 181-147.000.
Horstmann, Georg. Irradiation apparatus including a low-pressure mercury lamp with fluid medium duct means. 4,323,810, Cl. 313-24.000.
Hosaka, Akihiko: *See*—
Okuyama, Kiyotaka; and Hosaka, Akihiko, 4,323,628, Cl. 428-425.900.
Hospital Physics Oy: *See*—
Riihimaki, Esko; and Savikurki, Seppo, 4,323,782, Cl. 250-252.000.
Houdard, Jean-Pierre; Julie, Jean-Jacques; and Leoni, Bernard G., to Le Materiel Telephonique Thomson-CSF. Digital filter for shared-time processing on several channels. 4,323,980, Cl. 364-724.000.
Houghton, Curtis C.: *See*—
Wheaton, Frank H., III; and Houghton, Curtis C., 4,323,158, Cl. 209-524.000.
Howes, Peter D.: *See*—
Abell, Gurdon R.; Cook, Francis J.; and Howes, Peter D., 4,323,925, Cl. 358-213.000.
Hoyer, Ernst; Meininger, Fritz; and Fass, Rudolf, to Hoechst Aktiengesellschaft. Water-soluble disazo dyestuffs. 4,323,497, Cl. 260-146.00T.
Huber, Willi, to J. Wagner AG. Electrostatic gun with improved diode-capacitor multiplier. 4,323,947, Cl. 361-228.000.
Hubner, Otto. Radiant heat hair dryer. 4,323,761, Cl. 219-377.000.
Huckabee, Kermit D.; Adair, James C; and Worrell, Gene T., to Shell Oil Company. Wide seismic source. 4,323,989, Cl. 367-17.000.
Huelle, Zbigniew R.; and Nielsen, Leif, to Danfoss A/S. Actuating apparatus for adjusting a movable element, particularly the closure member of a valve. 4,323,220, Cl. 251-11.000.
Humber, Leslie G.: *See*—
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, 4,323,572, Cl. 424-251.000.
Hummel, Richard L. Solar energy collection system. 4,323,054, Cl. 126-449.000.
Hund, Franz: *See*—
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,323,596, Cl. 427-127.000.
Hunsucker, Jerry H.; and Woods, Milton E., to International Minerals & Chemical Corp. Method of preparing wrinkle-resistant fabric. 4,323,624, Cl. 428-270.000.
Hunt, Arthur J.; and Hunt, Arthur J., Jr. Method of extraction of juice from fruit. 4,323,007, Cl. 100-37.000.
Hunt, Arthur J., Jr.: *See*—
Hunt, Arthur J.; and Hunt, Arthur J., Jr., 4,323,007, Cl. 100-37.000.
Hunt, James G., to Polymet Corporation. Manufacture of high performance alloy in elongated form. 4,323,186, Cl. 228-173.00E.
Hunter, Charles R.: *See*—
Murch, Charles K.; and Hunter, Charles R., 4,322,946, Cl. 60-203.100.
Hussey, James L.; Miller, Michael B.; and Staker, William C., Jr., to General Motors Corporation. Power antenna with resilient mounting means. 4,323,902, Cl. 343-903.000.
Hutchinson-Mapa: *See*—
Bertin, Jacques, 4,323,254, Cl. 277-40.000.
Hutchison, Mark A., to National Service Industries, Inc. Floodlight. 4,323,953, Cl. 362-226.000.
Huwa, Yoshio: *See*—
Kondo, Katsumi; Huwa, Yoshio; and Miyazaki, Syouzi, 4,323,257, Cl. 277-224.000.
Hybricon, Inc.: *See*—
Smith, Stephen H., 4,323,849, Cl. 324-428.000.
Hydril Company: *See*—
Miyagishima, Tosh; and Motoda, Calvin, 4,323,256, Cl. 277-126.000.
Hydro-Test, Inc.: *See*—
Ball, Frank C.; and Wardle, Edmund, 4,322,969, Cl. 73-40.50R.
Hydrocarbon Research, Inc.: *See*—
Chervenak, Michael C.; Johanson, Edwin S.; and Rakow, Marvin S., 4,323,446, Cl. 208-8.00R.

Iannelli, Frank M.: *See*—
Whorton, Robert B., III; Crosby, Samuel C., Jr.; Iannelli, Frank M.; Denmark, James; and Jeans, Edward L., 4,323,171, Cl. 222-82.000.
Ibuki, Yasuhiro, to Meinan Machinery Works, Inc. Reinforced veneer sheet and the method of manufacturing the reinforced veneer sheet. 4,323,616, Cl. 428-134.000.
Idec, Eric J., to Eyelet Specialty Co., Inc. Bottom-fillable lipstick or the like container. 4,323,157, Cl. 206-385.000.
Idzu, Genichi: *See*—
Ohkuma, Takaaki; Ninomiya, Hiroshi; Nakamura, Masaaki; and Idzu, Genichi, 4,323,577, Cl. 424-298.000.
Iftikar, Syed H.; and Reeck, David L., to Shugart Technology. Hard fixed disc drive assembly and read-write head actuator. 4,323,939, Cl. 360-106.000.
IGM-Industriegerate und Maschinenfabriks-Gesellschaft mbH: *See*—
Vokurka, Franz, 4,323,758, Cl. 219-125.100.
Iguchi, Shozo: *See*—
Imazeki, Kazuyoshi; and Iguchi, Shozo, 4,323,839, Cl. 323-267.000.
Iijima, Tetsuya, to Nissan Motor Co., Ltd. Temperature control device for automobile air conditioner. 4,323,111, Cl. 165-25.000.
Ikeda, Atsuo: *See*—
Kuribayashi, Hiroshi; and Ikeda, Atsuo, 4,323,997, Cl. 369-33.000.
Ikeda, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Cleaning material supplying apparatus with cleaning material storing vessel controlled by lid position. 4,323,170, Cl. 222-70.000.
Imai, Tamotsu, to UOP Inc. Etherification of olefinic hydrocarbons. 4,323,712, Cl. 568-697.000.
Imazeki, Kazuyoshi; and Iguchi, Shozo. Constant current load and constant voltage load power supply. 4,323,839, Cl. 323-267.000.
Imi Yorkshire Imperial Plastics Limited: *See*—
Aston, William C.; and Walker, Derek, 4,323,535, Cl. 264-528.000.
Imperial Chemical Industries Limited: *See*—
Bornat, Alan, 4,323,525, Cl. 264-24.000.
Higgins, Irving J., 4,323,649, Cl. 435-136.000.
Jones, Geraint, 4,323,575, Cl. 424-267.000.
Milner, David J., 4,323,509, Cl. 260-346.110.
Norval, Stephen V., 4,323,699, Cl. 562-416.000.
Snowden, Paul, 4,323,524, Cl. 264-8.000.
Inadomi, Seigo: *See*—
Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, 4,323,626, Cl. 428-374.000.
Incom International, Inc.: *See*—
Kirkwood, Creal E., 4,323,353, Cl. 440-63.000.
Industrie Pirelli S.p.A.: *See*—
Sarracino, Marcello, 4,322,941, Cl. 57-16.000.
Infrared Industries, Inc.: *See*—
Baskins, Lowell L.; and Durham, Rodney M., 4,323,777, Cl. 250-339.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Demonte, Filippo; and Figini, Mario, 4,323,315, Cl. 400-63.000.
Inohara, Masanobu, to Asics Corporation. Sport shoe sole. 4,322,891, Cl. 36-29.000.
Inohara, Masanobu, to Asics Corporation. Sport shoe sole. 4,322,892, Cl. 36-29.000.
Inotech Process Ltd.: *See*—
Cowan, Wavell F.; Green, Marshall S.; and McGurk, Stanley E., 4,323,426, Cl. 162-398.000.
Inoue, Jiro, to Murata Manufacturing Co., Ltd. Filter circuit. 4,323,866, Cl. 333-188.000.
Inoue, Takayuki: *See*—
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.
Inoue, Tsunehiko: *See*—
Shinagawa, Takehisa; and Inoue, Tsunehiko, 4,323,374, Cl. 55-132.000.
Institute of Gas Technology: *See*—
Ghosh, Sambhunath, 4,323,367, Cl. 48-197.00A.
Instrumentation Laboratory Inc.: *See*—
Mody, Dinesh I., 4,323,537, Cl. 422-63.000.
Intel Magnetics, Inc.: *See*—
Lee, David M.; Rose, Donald K.; and Clover, Richmond B., 4,323,983, Cl. 365-8.000.
International Business Machines Corporation: *See*—
Abbas, Shakir A.; and Magdo, Ingrid E., 4,322,883, Cl. 29-578.000.
Berndlmaier, Erich; Clark, Bernard T.; and Dorler, Jack A., 4,323,914, Cl. 357-82.000.
Capozzi, Anthony J., 4,323,968, Cl. 364-200.000.
Lee, Francis C.; Mills, Ross N.; and Talke, Frank E., 4,323,908, Cl. 346-140.00R.
Malaviya, Shashi D., 4,323,986, Cl. 365-174.000.
Ray, Asit K.; and Reisman, Arnold, 4,323,589, Cl. 427-38.000.
International Harvester Company: *See*—
Domes, E. A.; Taylor, Forrest C.; Vacval, Dusan M.; and Venere, Lawrence A., 4,323,279, Cl. 298-23.0DF.
International Minerals & Chemical Corp.: *See*—
Hunsucker, Jerry H.; and Woods, Milton E., 4,323,624, Cl. 428-270.000.
International Paper Company: *See*—
Callahan, Kevin M., 4,323,168, Cl. 221-42.000.
International Standard Electric Corporation: *See*—
Schmidt, Peter; and Muhlberger, Emil, 4,322,876, Cl. 29-25.190.
International Telephone and Telegraph Corporation: *See*—
Dunning, Stephen C.; and Sutherland, Joseph E., 4,323,790, Cl. 370-102.000.
IPCO Corporation: *See*—
Weissman, Bernard, 4,323,347, Cl. 433-141.000.
Ipri, Alfred C.: *See*—
Sokoloski, Joseph C.; and Ipri, Alfred C., 4,323,910, Cl. 357-23.000.
IRD Mechanalysis, Inc.: *See*—
Sisson, Edwin D.; Stoutenburg, Donn V.; and Thomas, Glen H., 4,322,976, Cl. 73-659.000.
Isaac, Edward J.: *See*—
Keches, Leonidas A.; Goggin, Sharon R.; Isaac, Edward J.; and Rogers, Ronald J., 4,323,247, Cl. 273-235.00R.
Ishida, Toru: *See*—
Hattori, Masumi; Ishida, Toru; and Tanaka, Shinichi, 4,323,484, Cl. 252-521.000.
Ishigaki, Kunio: *See*—
Nakamura, Taku; Ogawa, Masasi; and Ishigaki, Kunio, 4,323,644, Cl. 430-518.000.
Ishihara, Hideo; Suzuki, Shizuo; and Nakabo, Satoru, to Kokusai Denshin Denwa Kabushiki Kaisha. Switching equipment using magnetic domains. 4,323,984, Cl. 365-10.000.
Ishihara, Tetsuo: *See*—
Oka, Yoshitake; Ishihara, Tetsuo; Suzuki, Masane; and Kanaya, Motonori, 4,323,757, Cl. 219-121.0LN.
Ishii, Fumiaki, to Olympus Optical Co., Ltd. Device for fitting an attachment to an endoscope ocular section. 4,323,304, Cl. 354-62.000.
Ishii, Junichi. Baseball bat. 4,323,239, Cl. 273-72.00A.
Ishii, Masaaki: *See*—
Kawamura, Naoto; Masegi, Koichi; Hakamada, Isao; Uchiyama, Haruo; Kitamura, Takashi; and Ishii, Masaaki, 4,323,297, Cl. 350-6.800.
Isover Saint-Gobain: *See*—
Meunier, Georges, 4,323,384, Cl. 65-335.000.
isoya, Toshiro: *See*—
Kawamura, Chikayuki; isoya, Toshiro; and Yamataka, Kazunori, 4,323,444, Cl. 204-269.000.
Italiano, Victor J., to NCR Corporation. Valve for ink jet printer. 4,323,907, Cl. 346-140.00R.
Italtractor I.T.M. S.p.A.: *See*—
Grilli, Walter; Manicardi, Emidio; and Ferrari, Ivano, 4,323,185, Cl. 228-114.000.
Ito, Kazuo: *See*—
Sawada, Susumu; Fukuda, Takashi; Tsuchiya, Katsuhiro; and Ito, Kazuo, 4,323,404, Cl. 148-148.000.
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Mohvama, Yoshikuni, to Canon Kabushiki Kaisha. Developer cleaning device for electrophotography. 4,323,306, Cl. 355-15.000.
Itoh Metal Abrasive Co., Ltd.: *See*—
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,323,523, Cl. 264-8.000.
Itoi, Eiji; Nakayama, Takashi; Nakao, Makoto; and Matsumura, Yukio, to Asahi Glass Company, Ltd. Purification of aqueous solution of potassium chloride. 4,323,436, Cl. 204-98.000.
ITT Industries, Inc.: *See*—
Hoehn, Wolfgang, 4,323,794, Cl. 307-296.00R.
Minks, Werner, 4,323,869, Cl. 335-274.000.
Ivanchev, Sergei S.: *See*—
Shirinian, Vram T.; Mnatsakanov, Suren S.; Pavljuchenko, Valery N.; Rozenberg, Mark E.; Gromov, Valery V.; and Ivanchev, Sergei S., 4,323,666, Cl. 526-329.000.
Ivanov, Valery K.: *See*—
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.
Iwabuchi, Suminobu; and Matsui, Kazumasa, to Yuasa Battery Company Limited. Multilayer heat insulator. 4,323,620, Cl. 428-215.000.
Iwado, Seigo: *See*—
Tanzawa, Kazuhiko; Iwado, Seigo; Tsujita, Yoshio; Kuroda, Masao; and Furuya, Kouhei, 4,323,648, Cl. 435-125.000.
Iwasaki, Hiroshi: *See*—
Kondo, Mitsuru; Iwasaki, Hiroshi; Yasui, Kiyoshi; and Miyake, Makoto, 4,323,700, Cl. 562-460.000.
Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Acceleration and deceleration sensor. 4,322,973, Cl. 73-517.00R.
Iwasaki, Yosimi, to Hokkaido Sugar Co., Ltd. Method for generation of hot gas by incineration of combustile material and apparatus for generation of hot gas by incineration of combustible material. 4,323,018, Cl. 110-208.000.
Iwasaki, Yukio: *See*—
Nounen, Michiyasu; and Iwasaki, Yukio, 4,323,873, Cl. 337-186.000.
Iwase, Kozi: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Iwase, Kozi; Kubotera, Haruo; Kurihara, Takao; and Tanaka, Nobuo, 4,323,403, Cl. 148-134.000.
J. Wagner AG.: *See*—
Huber, Willi, 4,323,947, Cl. 361-228.000.
Jackson, Harold E., to Plympton Patents Limited. Control arrangements for heating circuits. 4,323,192, Cl. 236-46.00R.
Jacobi, Haireddin: *See*—
Opitz, Wolfgang; Etscherberg, Eugen; Dell, Hans-Dieter; and Jacobi, Haireddin, 4,323,517, Cl. 260-455.00R.

Jacobsen, Leif V., to Albertus, Christian Gundorph; Hansen, Erik Steinmann; and Giortz, Leif Heegaard. Indicating device for use in airfield lighting plants technical field. 4,323,841, Cl. 324-51.000.
Jacoby, George V., to Sperry Corporation. Method and apparatus for encoding and recovering binary digital data. 4,323,931, Cl. 360-40.000.
Jadwin, Thomas A., to Eastman Kodak Company. Electrographic toner and developer composition containing quaternary ammonium salt charge control agent. 4,323,634, Cl. 430-110.000.
Jaeggli Maschinenfabrik AG: *See*—
Keller, Werner, 4,323,359, Cl. 8-155.000.
Jagenberg Werke AG: *See*—
Knuppertz, Heinz W.; and Lederer, Hans, 4,323,029, Cl. 118-231.000.
James Howden Australia Pty. Limited: *See*—
Miljoen, Rodney W., 4,323,378, Cl. 55-378.000.
Jamieson, David J. Self retaining uterine elevator. 4,323,057, Cl. 128-17.000.
Jamrus, Kenneth J., to General Electric Company. Deceleration buffer for hydraulic linear motion drive. 4,323,427, Cl. 376-230.000.
Jan, Gerald; Hagen, Remon; and Lenoir, John, to Ciba Geigy AG. Quinoxalines and their use in photographic processes. 4,323,682, Cl. 544-353.000.
Janome Sewing Machine Co. Ltd.: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,323,022, Cl. 112-158.00E.
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, 4,323,833, Cl. 318-376.000.
Japan Steel Works Ltd., The: *See*—
Sawada, Susumu; Fukuda, Takashi; Tsuchiya, Katsuhiro; and Ito, Kazuo, 4,323,404, Cl. 148-148.000.
Jardine, Colin D.; Chong, Sooi; Coles, Rodney H.; and Hebb, Stephen, to Hanna Mining Company, The. Mill liner for dry autogenous mills. 4,323,199, Cl. 241-284.000.
Jarman, Davis R.; and Hinson, Virgil H. Datum line gauge system. 4,322,890, Cl. 33-288.000.
Jarvis, Michael F.: *See*—
Nolte, Robert K.; Rath, Robert E.; and Jarvis, Michael F., 4,323,091, Cl. 134-60.000.
Jaskolski, Stanley V.: *See*—
Schutten, Herman P.; Jaskolski, Stanley V.; Spellman, Gordon B.; Lade, Robert W.; and Schutten, Michael J., 4,323,793, Cl. 307-252.00R.
Jaster, Heinz, to General Electric Company. Open cycle heat pump system and process for transferring heat. 4,323,109, Cl. 165-1.000.
Jeans, Edward L.: *See*—
Whorton, Robert B., III; Crosby, Samuel C., Jr.; Iannelli, Frank M.; Denmark, James; and Jeans, Edward L., 4,323,171, Cl. 222-82.000.
Jeanson, Richard L.: *See*—
Hickman, John S.; Olson, John B.; and Jeanson, Richard L., 4,323,290, Cl. 312-100.000.
Jefferson, Donald E.: *See*—
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.
Jelinek, Istvan: *See*—
Lugosi, Gyorgy; May, Antal S.; Bodnar, Janos; Turcsan, Istvan; Jelinek, Istvan; Somfai, Eva; and Simandi, Laszlo, 4,323,469, Cl. 252-182.000.
Jenkins, Carl B., Jr.; Porenski, Harry S., Jr.; and Turner, Paul N., to Brown & Williamson Tobacco Corporation. Method and apparatus for tobacco leaf destemming. 4,323,084, Cl. 131-319.000.
Jepsen, Marshall P. Combined internal combustion and steam engine. 4,322,950, Cl. 60-712.000.
Jernstrom Design Workshop, Inc.: *See*—
Jernstrom, Hans E. I.; Long, Thomas L.; and Liedtke, Ronald, 4,323,238, Cl. 273-1.00G.
Jernstrom, Hans E. I.; Long, Thomas L.; and Liedtke, Ronald, to Jernstrom Design Workshop, Inc. Action toy requiring space perception and eye/hand coordination. 4,323,238, Cl. 273-1.00G.
Joh, Yasushi, to Nippon Zeon Co., Ltd. Hollow fiber and method of manufacturing the same. 4,323,627, Cl. 428-398.000.
Johanson, Edwin S.: *See*—
Chervenak, Michael C.; Johanson, Edwin S.; and Rakow, Marvin S., 4,323,446, Cl. 208-8.00R.
John Zink Company: *See*—
Reed, Robert D.; and Schwartz, Robert E., 4,323,343, Cl. 431-202.000.
Johns, Robert L. Article display units and members for forming them. 4,323,163, Cl. 211-189.000.
Johnson & Johnson: *See*—
Gander, Robert J., 4,323,581, Cl. 424-324.000.
Johnson, Keith I.: *See*—
Edson, Donald A.; Johnson, Keith I.; and Scott, Michael H., 4,323,759, Cl. 219-137.0PS.
Johnson, Robert B.; Nibby, Chester M., Jr.; and Moore, Dana, to Honeywell Information Systems Inc. Sequential chip select decode apparatus and method. 4,323,965, Cl. 364-200.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., to Upjohn Company, The. PGI_2 Amides. 4,323,672, Cl. 542-421.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-PGI_2 compounds. 4,323,673, Cl. 542-426.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., to Upjohn Company, The. PGI_2 Analogs. 4,323,674, Cl. 542-426.000.
Johnston, John N., to Litton Business Systems, Inc. Cartridge and bezel assembly for a calculator. 4,323,979, Cl. 364-708.000.
Jolin, Marcel, to Dustell LTEE. Mobile dust collector. 4,323,377, Cl. 55-341.0HM.
Jones, C. David: *See*—
Suarez, Tulio; and Jones, C. David, 4,323,707, Cl. 564-324.000.
Jones, Duane A.; and Elmquist, Lyle F., to Henkel Corporation. Absorbent starch graft polymer and method of its preparation. 4,323,487, Cl. 525-54.320.
Jones, Gary D.; Laidig, Manfred R.; and Weisz, William, to Singer Company, The. Presser bar guide. 4,323,024, Cl. 112-237.000.
Jones, Geraint, to Imperial Chemical Industries Limited. 1-Phenyl-2-aminoethanol derivatives. 4,323,575, Cl. 424-267.000.
Jones, Lee J., to Ten-Tec, Inc. Dual mode direct current power supply. 4,323,960, Cl. 363-48.000.
Jordan, Gerald J. Wheel assembly. 4,322,869, Cl. 16-46.000.
Josephson, Elliot, to Astec Components, Ltd. Free-running flyback DC power supply. 4,323,961, Cl. 363-56.000.
Jova Enterprises, Inc.: *See*—
Gerling, John E., 4,323,746, Cl. 219-10.55F.
Joy, George C., III, to UOP Inc. Catalytic conversion of carbon monoxide, hydrocarbons and oxides of nitrogen. 4,323,542, Cl. 423-213.500.
Joyce, Thomas F.: *See*—
Peters, Arthur; Negi, Virendra S.; Cushing, David E.; Brown, Richard P.; and Joyce, Thomas F., 4,323,967, Cl. 364-200.000.
Juan, Mathias: *See*—
Dieulot, Gerard; Juan, Mathias; and Fardeau, Michel, 4,323,770, Cl. 235-375.000.
Judd, Duncan B.: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; MacKinnon, John W. M.; Judd, Duncan B.; and Carey, Linda, 4,323,566, Cl. 424-248.510.
Jufer, Marcel: *See*—
Xuan, Mai T.; Jufer, Marcel; and Pittet, Andre, 4,323,834, Cl. 318-696.000.
Juhasz, John M.: *See*—
Sell, Robert C.; Sheler, John R.; and Juhasz, John M., 4,322,977, Cl. 73-701.000.
Julie, Jean-Jacques: *See*—
Houdard, Jean-Pierre; Julie, Jean-Jacques; and Leoni, Bernard G., 4,323,980, Cl. 364-724.000.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brunner, Josef, 4,323,213, Cl. 248-222.100.
Jump for Joy Ltd.: *See*—
Wilson, Robert M., 4,323,231, Cl. 272-65.000.
Jung, Michel: *See*—
Metcalf, Brian W.; Jung, Michel; and Danzin, Charles, 4,323,704, Cl. 562-561.000.
Jungerwirth, Bernard R., to Coats and Clark, Inc. Adaptive exercise apparatus. 4,323,237, Cl. 272-131.000.
Junino, Alex: *See*—
Bugaut, Andree; and Junino, Alex, 4,323,360, Cl. 8-407.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Muramoto, Ei-ichi; and Matsui, Motomu, 4,323,283, Cl. 305-10.000.
Kabushiki Kaisha Shibaura Seisakusho: *See*—
Yamazaki, Kazuhide; Ogawa, Shigetoshi; Suma, Atsushi; and Nakajima, Maki, 4,323,014, Cl. 104-13.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Morita, Masayuki; Nakano, Tasuku; and Kubota, Kazuhisa, 4,323,877, Cl. 340-56.000.
Kabushiki Kaisha Tokiwa Seisakusho: *See*—
Saito, Retsuo; and Nagase, Junji, 4,323,048, Cl. 124-78.000.
Kadono, Mamoru; and Saigusa, Tetsuji, to Bridgestone Tire Company Limited. Hose end construction. 4,323,089, Cl. 138-109.000.
Kaduk, James A., to Standard Oil Company (Indiana). Synthesis of molecular sieves using beta-diketones as organic templates. 4,323,481, Cl. 252-455.00Z.
Kai Cutlery Center Co., Ltd.: *See*—
Osada, Hiroshi, 4,322,885, Cl. 30-162.000.
Kaiser-Wirz, Max. Process and apparatus for adding liquid components to pourable powdered or granular materials. 4,323,314, Cl. 366-167.000.
Kakehi, Sasuga: *See*—
Tanaka, Yasuhiro; and Kakehi, Sasuga, 4,323,865, Cl. 333-187.000.
Kalleberg, Melvin O.: *See*—
Brown, James N.; and Kalleberg, Melvin O., 4,322,875, Cl. 24-204.000.
Kamp, Eugene L.; Popeck, Charles A.; and Bruning, Armin M., to A. B. Chance Company. Circuit protecting apparatus including resettable vacuum fuse and switch. 4,323,871, Cl. 337-7.000.
Kanaya, Motonori: *See*—
Oka, Yoshitake; Ishihara, Tetsuo; Suzuki, Masane; and Kanaya, Motonori, 4,323,757, Cl. 219-121.0LN.
Kanaya, Yoshihiro: *See*—
Takase, Tadayoshi; and Kanaya, Yoshihiro, 4,323,747, Cl. 219-10.55C.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Kondo, Mitsuru; Iwasaki, Hiroshi; Yasui, Kiyoshi; and Miyake, Makoto, 4,323,700, Cl. 562-460.000.
Kaplan, Alan. Crystal plating apparatus. 4,323,031, Cl. 118-720.000.
Karbowski, James P., to Triple Dee Electronics Inc. Oscillator type metal detector with switch controlled fixed biasing. 4,323,847, Cl. 324-327.000.
Karjala, Arnold L. Method and apparatus for flow-rate verification and calibration. 4,322,972, Cl. 73-168.000.

Karl Lautenschlager KG., Mobelbeschlagfabrik: *See*—
Lautenschlager, Gerhard W., 4,322,870, Cl. 16-235.000.
Karl M. Reich Maschinenfabrik GmbH, Firma: *See*—
Maurer, Werner, 4,323,184, Cl. 227-120.000.
Karlsen, Erich: *See*—
Zirn, Rudolf F.; and Karlsen, Erich, 4,323,167, Cl. 220-408.000.
Karlsen, Lasse K.: *See*—
Soderblom, Olof; and Karlsen, Lasse K., 4,323,993, Cl. 367-127.000.
Kashiwada, Akio: *See*—
Yoshida, Mitsuo; Masuda, Yoshinori; and Kashiwada, Akio, 4,323,434, Cl. 204-98.000.
Kasparek, Jaromir: *See*—
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.
Kato, Kenji: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,323,022, Cl. 112-158.00E.
Katsuyama, Toshio: *See*—
Matsuyama, Iwao; Susa, Kenzo; Suganuma, Tsuneo; Satoh, Shin; Katsuyama, Toshio; and Obayashi, Hidehito, 4,323,381, Cl. 65-32.000.
Katzenberger, Helmut. Method for making light weight concrete building elements. 4,323,527, Cl. 264-45.100.
Kawabata, Nariyoshi; Yasuda, Shinichi; and Yamazaki, Takeshi, to Koei Chemical Co., Ltd. Process for recovering a carboxylic acid. 4,323,702, Cl. 562-485.000.
Kawakami, Kanji: *See*—
Suzuki, Seikou; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Hachino, Hiroaki; and Takahashi, Minoru, 4,322,980, Cl. 73-727.000.
Kawamata, Motoo: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,323,662, Cl. 525-281.000.
Kawamoto, Akira: *See*—
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,322,952, Cl. 62-198.000.
Kawamura, Chikayuki; isoya, Toshiro; and Yamataka, Kazunori, to Asahi Kasei Kogyo Kabushiki Kaisha. Filter press-type electrolytic cell. 4,323,444, Cl. 204-269.000.
Kawamura, Naoto; Masegi, Koichi; Hakamada, Isao; Uchiyama, Haruo; Kitamura, Takashi; and Ishii, Masaaki, to Canon Kabushiki Kaisha. Image forming optical system using a semiconductor laser. 4,323,297, Cl. 350-6.800.
Kawasaki Steel Corporation: *See*—
Nakanishi, Teruyuki; and Hitomi, Kiyoshi, 4,322,962, Cl. 72-234.000.
KCS Industries, Inc.: *See*—
Muderlak, Kenneth J., 4,322,904, Cl. 40-495.000.
Kear, Bernard H.: *See*—
Brown, Clyde O.; Breinan, Edward M.; and Kear, Bernard H., 4,323,756, Cl. 219-121.0LF.
Koches, Leonidas A.; Goggin, Sharon R.; Isaac, Edward J.; and Rogers, Ronald J., to Acushnet Company. Golf ball cover. 4,323,247, Cl. 273-235.00R.
Kecskes, Istvan: *See*—
Furjes, Emil; and Kecskes, Istvan, 4,323,108, Cl. 164-488.000.
Keller, Werner, to Jaeggli Maschinenfabrik AG. Machine for the continuous wet treatment of textile thread formations, the process for operating the machine, as well as a non-touching catch-thread device. 4,323,359, Cl. 8-155.000.
Kellerwessel: *See*—
Bleckmann, Hugo; and Kellerwessel, 4,323,532, Cl. 264-118.000.
Kelley, Dale T. Bicycle safety flasher with optional mounting means for other uses. 4,323,879, Cl. 340-134.000.
Kelly, Charles J.: *See*—
Fork, Frank W.; and Kelly, Charles J., 4,323,723, Cl. 174-48.000.
Kelly, Thomas: *See*—
Krober, Hubert D.; and Kelly, Thomas, 4,323,221, Cl. 251-58.000.
Kelvin Lenses Limited: *See*—
Dawson, Peter; and Phillips, John H., 4,323,850, Cl. 324-439.000.
Kendall Company, The: *See*—
Canty, Herbert G., 4,323,062, Cl. 128-132.00D.
Kennecott Corporation: *See*—
Marshall, David W., 4,323,599, Cl. 427-181.000.
Kenscot Industries Limited: *See*—
Scott, Kenneth E., 4,322,927, Cl. 52-188.000.
Kera, Masakazu: *See*—
Hasegawa, Takanori; Shimada, Takanobu; Sato, Takao; Kera, Masakazu; Yoshida, Shuntaro; and Shimoyama, Shinichi, 4,323,775, Cl. 250-317.100.
Kernforschungsanlage Julich GmbH: *See*—
Knust, Ernst J.; Kupfernagel, Christiane; and Stocklin, Gerhard, 4,323,547, Cl. 424-1.000.
Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung: *See*—
Hofmann, Albert, 4,323,800, Cl. 310-52.000.
Muller, Stefan; Thun, Gerhard; and Glauner, Wolfgang, 4,322,982, Cl. 73-861.220.
Kertesz, Denis J.: *See*—
Fried, John H.; Kertesz, Denis J.; and Marx, Michael, 4,323,564, Cl. 424-241.000.
Kervennal, Jacques: *See*—
Cognion, Jean-Marie; and Kervennal, Jacques, 4,323,515, Cl. 260-453.00P.
Keske, Robert G.; and Stephens, James R., to Standard Oil Company (Indiana). Injection moldable amide-imide polymers contaning divalent aliphatic radicals derived from aliphatic diamines. 4,323,493, Cl. 524-451.000.
Kessler, Arthur: *See*—
Bergmann, Gunther; and Kessler, Arthur, 4,323,792, Cl. 307-549.000.
Kienzle Apparate GmbH: *See*—
Fichter, Manfred, 4,323,933, Cl. 346-74.300.
Kikumoto, Kyoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, to Mitsubishi Chemical Industries Limited. Pharmaceutically active (omega-aminoalkoxy)bibenzyls. 4,323,568, Cl. 424-250.000.
Kildishev, Vasily S.: *See*—
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.
Kim, Dae-Eun. Adjuvant for stimulating production of lymphocytes. 4,323,562, Cl. 424-195.000.
Kim, Yoobong. Anti-skid tire guard. 4,323,103, Cl. 152-213.00A.
Kimura, Tadashi, to Olympus Optical Co., Ltd. Wide-angle zoom lens system. 4,323,302, Cl. 350-426.000.
Kimura, Tsutomu: *See*—
Ohnishi, Masahiro; and Kimura, Tsutomu, 4,323,906, Cl. 346-76.00L.
Kimzey, Gene A., to Crest Industries, Inc. Interface circuit for telephone line to equipment signal coupling. 4,323,734, Cl. 179-18.0FA.
Kincaid, John W.; and Ward, Robert E., to Belden Corporation. Electric cables with improved shielding member. 4,323,721, Cl. 174-36.000.
Kindig, Morris L. Apparatus for beveling glass. 4,322,915, Cl. 51-3.000.
Kinefac Corp.: *See*—
Greis, Howard A., 4,322,961, Cl. 72-95.000.
King, William C.; and Knight, Stephen, to Bell Telephone Laboratories, Incorporated. Impulse activated time delay self-restoring switch. 4,323,799, Cl. 307-571.000.
King, William M.: *See*—
Berdan, Betty L.; and King, William M., 4,323,632, Cl. 428-626.000.
Kinghorn, John R., to U.S. Philips Corporation. Alpha-numeric character generator arrangement. 4,323,892, Cl. 340-724.000.
Kintopp, Erich: *See*—
Distler, Walter; and Kintopp, Erich, 4,323,783, Cl. 250-445.00T.
Kirimoto, Kazunari: *See*—
Nishimura, Hiroshi; Monma, Tetsuo; Yoshida, Minoru; Kirimoto, Kazunari; Hayamizu, Yoshio; and Nagasawa, Toshio, 4,323,607, Cl. 219-213.000.
Kirkwood, Creal E., to Incom International, Inc. Boat steering apparatus. 4,323,353, Cl. 440-63.000.
Kitajima, Tadayuki; and Tohyama, Yoshikuni, to Canon Kabushiki Kaisha. Copy magnification modifying apparatus. 4,323,308, Cl. 355-57.000.
Kitajima, Tadayuki: *See*—
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Mohvama, Yoshikuni, 4,323,306, Cl. 355-15.000.
Kitamura, Takashi: *See*—
Kawamura, Naoto; Masegi, Koichi; Hakamada, Isao; Uchiyama, Haruo; Kitamura, Takashi; and Ishii, Masaaki, 4,323,297, Cl. 350-6.800.
Klein, Theodore H., to Bell Telephone Laboratories, Incorporated. Fabrication of conductor-clad composites using molding compounds and techniques. 4,323,421, Cl. 156-630.000.
Kleykamp, Donald L., to Dayco Corporation. Method of welding wear member for railway vehicle. 4,323,751, Cl. 219-91.210.
Klimenko, Vladimir I.: *See*—
Alekhin, Stanislav A.; Kuznetsov, Eduard B.; Bakhir, Vitold M.; Klimenko, Vladimir I.; and Zadorozhny, Jury G., 4,323,445, Cl. 204-300.00R.
Kling, Jarrett B. Integrated circuit carrier. 4,323,155, Cl. 206-328.000.
Kling, John E., to Baxter Travenol Laboratories, Inc. Attachable connector for catheter. 4,323,065, Cl. 128-214.00R.
Klinikowski, James J.: *See*—
Hoenig, Richard J.; and Klinikowski, James J., 4,323,064, Cl. 128-204.210.
Klockner-Humboldt-Deutz AG: *See*—
Bleckmann, Hugo; and Kellerwessel, 4,323,532, Cl. 264-118.000.
Herchenbach, Horst; Ramesohl, Hubert; and Brachthauser, Kunibert, 4,323,397, Cl. 106-100.000.
Kmonk, Stanley: *See*—
Schallenberger, John M.; Kmonk, Stanley; and Ferlan, Stephen J., 4,323,428, Cl. 376-353.000.
Knight, Stephen: *See*—
King, William C.; and Knight, Stephen, 4,323,799, Cl. 307-571.000.
Knopik, Dwayne L. Process for recovering organic liquids from underground areas. 4,323,122, Cl. 166-267.000.
Knorr, Harald, to Hoechst Aktiengesellschaft. Process for the preparation of N,N'-diformylhydrazine. 4,323,705, Cl. 564-151.000.
Knud Simonsen Industries Limited: *See*—
Buller-Colthurst, Guy E., 4,322,874, Cl. 17-44.400.
Knuppertz, Heinz W.; and Lederer, Hans, to Jagenberg Werke AG. Labeling machine, especially for bottles having a four-way toggle mechanism as a drive. 4,323,029, Cl. 118-231.000.
Knust, Ernst J.; Kupfernagel, Christiane; and Stocklin, Gerhard, to Kernforschungsanlage Julich GmbH. Labeled fatty acids and method of making and using same. 4,323,547, Cl. 424-1.000.

Kobayashi, Hiroo: *See*—
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Mohvama, Yoshikuni, 4,323,306, Cl. 355-15.000.

Kobayashi, Robert J.: *See*—
Byrne, Joe L.; Kobayashi, Robert J.; and Nancarrow, James H., 4,322,949, Cl. 60-606.000.

Kobayashi, Ryuji: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.

Kobayashi, Shigeki: *See*—
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,323,523, Cl. 264-8.000.

Kobayashi, Toshio; and Oi, Tetsu, to Hitachi, Ltd. Method for growing a pipe-shaped single crystal. 4,323,418, Cl. 156-617.0SP.

Kobe, Inc.: *See*—
Gilson, Dale P., 4,323,285, Cl. 308-160.000.

Kober, Heinrich; Nippe, Burkhard; and Seidel, Bernhard, to Agfa-Gevaert Aktiengesellschaft. Magnetic recording medium. 4,323,621, Cl. 428-216.000.

Kobori, Shigeyuki: *See*—
Suzuki, Seikou; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Hachino, Hiroaki; and Takahashi, Minoru, 4,322,980, Cl. 73-727.000.

Kocks Technik GmbH & Co.: *See*—
Moltner, Hermann; and Siebenborn, Wolfgang, 4,323,971, Cl. 364-469.000.

Koei Chemical Co., Ltd.: *See*—
Kawabata, Nariyoshi; Yasuda, Shinichi; and Yamazaki, Takeshi, 4,323,702, Cl. 562-485.000.

Koga, Nobuhito: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,323,662, Cl. 525-281.000.

Kohyama, Katsuhisa: *See*—
Mori, Hazime; Kohyama, Katsuhisa; Nakamura, Katsuhiko; and Takamatsu, Shinichi, 4,323,519, Cl. 528-499.000.
Mori, Hazime; Kohyama, Katsuhisa; and Nakamura, Katsuhiko, 4,323,663, Cl. 525-470.000.

Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, to Hitachi, Ltd. Solid-state imaging device. 4,323,912, Cl. 357-31.000.

Koito Seisakusho Co. Ltd.: *See*—
Schaer, Glenn R.; Touyama, Tasuku; Yamamoto, Teruaki; Honda, Keisuke; and Wada, Tatsuo, 4,323,441, Cl. 204-224.00R.

Koizumi, Satoru; Shimamura, Takashi; and Uchiyama, Sadao, to Sharp Kabushiki Kaisha. Nonprogram section detection mechanism in a cassette tape player. 4,323,935, Cl. 360-73.000.

Kojima, Mikio: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Ishihara, Hideo; Suzuki, Shizuo; and Nakabo, Satoru, 4,323,984, Cl. 365-10.000.

Kolbl, Richard; and Mehlan, Bernd, to Sielaff GmbH & Co. Coin-operated dispensing device reflecting the selling price of items to be dispensed. 4,323,147, Cl. 194-48.000.

Kondo, Katsumi; Huwa, Yoshio; and Miyazaki, Syouzi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Piston ring with a Cr-C-Fe inlaid ring in its outer surface, and a method of making it. 4,323,257, Cl. 277-224.000.

Kondo, Mitsuru; Iwasaki, Hiroshi; Yasui, Kiyoshi; and Miyake, Makoto, to Kanzaki Paper Manufacturing Co., Ltd. Process for preparing benzophenone derivatives. 4,323,700, Cl. 562-460.000.

Kondo, Yasuo, to Yamaha Hatsudoki Kabushiki Kaisha. Splash plate for marine propulsion devices. 4,323,355, Cl. 440-76.000.

Kopp, Arthur R., to AMP Incorporated. Circuit for reflective mode optical reader. 4,323,774, Cl. 250-214.00A.

Koppers Company, Inc.: *See*—
Hill, Robert E., 4,323,477, Cl. 252-397.000.

Korff, Wolfram G.; Emery, Vernon V.; and Bond, Joseph K. Selective multiple pipe compression belling machine. 4,323,337, Cl. 425-155.000.

Kotera, Norio: *See*—
Takahashi, Masatoshi; Kotera, Norio; Uegaki, Masatoshi; Miyaoka, Takashi; and Maegawa, Yuzo, 4,323,431, Cl. 203-72.000.

Koumura, Noboru: *See*—
Fujii, Motoharu; Koumura, Noboru; Ayata, Naoki; Saito, Seiji; and Sato, Yasushi, 4,323,919, Cl. 358-75.000.

Kovalenko, Vladimir V.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Kowalyshyn, Stephen: *See*—
Fisher, Seth G.; and Kowalyshyn, Stephen, 4,323,025, Cl. 114-25.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Weghaupt, Erich; and D'ham, Reinhold, 4,323,801, Cl. 310-52.000.

Krall, Albert D.; McCorkle, John W.; Scarzello, John F.; and Syeles, Albert M., to United States of America, Navy. Omnidirectional microstrip antenna. 4,323,900, Cl. 343-700.0MS.

Kraus, Helmut; Weinlich, Jurgen; and Plewan, Otto, to Hoechst Aktiengesellschaft. Sinterable, finely divided vinyl chloride molding composition and a process for its manufacture and use. 4,323,661, Cl. 525-259.000.

Krober, Hubert D.; and Kelly, Thomas. Power actuated valve. 4,323,221, Cl. 251-58.000.

Krohn, Duane D., to Graco, Inc. Mechanical deflection apparatus for sensing fluid pressure. 4,323,741, Cl. 200-81.90R.

Kruesi, Paul R.; and Frahm, Veryl H., Jr., to Southern Foundry Supply Company. Process for converting brass scrap to copper powder. 4,323,390, Cl. 75-0.50A.

Krupp Polysius AG: *See*—
Grudno, Hans-Dieter, 4,323,344, Cl. 432-106.000.

Kruse, Robert A. Portable display unit. 4,322,905, Cl. 40-606.000.

Kubiatowicz, David O., to Minnesota Mining and Manufacturing Company. Radioactive iodine seed. 4,323,055, Cl. 128-1.200.

Kubo, Masaharu: *See*—
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.

Kubota, Kazuhisa: *See*—
Morita, Masayuki; Nakano, Tasuku; and Kubota, Kazuhisa, 4,323,877, Cl. 340-56.000.

Kubota, Ltd.: *See*—
Bando, Niro; Miyata, Junji; Tone, Masatsugu; and Watanabe, Haruo, 4,323,137, Cl. 180-305.000.

Kubota, Naohiro; and Shibata, Toshihiro. Process for preparing a 2,2,6,6-tetraalkyl-4-piperidyl spiro aliphatic ether. 4,323,684, Cl. 546-19.000.

Kubotera, Haruo: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Iwase, Kozi; Kubotera, Haruo; Kurihara, Takao; and Tanaka, Nobuo, 4,323,403, Cl. 148-134.000.

Kuchuk-Yatsenko, Sergei I.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galyan, Boris A., 4,323,752, Cl. 219-101.000.

Kuckes, Arthur F., to Cornell Research Foundation, Inc. Plural sensor magnetometer arrangement for extended lateral range electrical conductivity logging. 4,323,848, Cl. 324-338.000.

Kuehnel, Werner: *See*—
Baumann, Heinz; Kuehnel, Werner; and Rattner, Manfred, 4,323,781, Cl. 250-422.000.

Kuhla, Donald E.: *See*—
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,323,506, Cl. 260-345.80R.

Kunieda, Toshiaki; Odagiri, Masaru; Fujita, Takashi; and Shinohara, Koichi, to Matsushita Electric Industrial Co., Ltd. Metallic thin film magnetic recording medium. 4,323,629, Cl. 428-457.000.

Kunimune, Kohichi; Hane, Teruaki; Inadomi, Seigo; and Furukawa, Yasuhiko, to Chisso Corporation. Heat-adhesive composite fibers. 4,323,626, Cl. 428-374.000.

Kupfernagel, Christiane: *See*—
Knust, Ernst J.; Kupfernagel, Christiane; and Stocklin, Gerhard, 4,323,547, Cl. 424-1.000.

Kurai, Nobuyoshi: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,323,135, Cl. 180-228.000.

Kuraray Co., Ltd.: *See*—
Tanaka, Yoshinobu; Ogawa, Koichi; and Hioka, Minoru, 4,323,455, Cl. 210-321.200.

Kuribayashi, Hiroshi; and Ikeda, Atsuo, to Pioneer Electronic Corporation. Linear-tracking pick-up arm drive assembly. 4,323,997, Cl. 369-33.000.

Kurihara, Takao: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Iwase, Kozi; Kubotera, Haruo; Kurihara, Takao; and Tanaka, Nobuo, 4,323,403, Cl. 148-134.000.

Kurita, Osamu: *See*—
Ogawa, Kazuo; Suzuki, Eiji; Kurita, Osamu; and Horikawa, Izumi, 4,323,864, Cl. 333-165.000.

Kuroda, Masao: *See*—
Tanzawa, Kazuhiko; Iwado, Seigo; Tsujita, Yoshio; Kuroda, Masao; and Furuya, Kouhei, 4,323,648, Cl. 435-125.000.

Kurokawa, Teruhisa, to Nippon Electric Co., Ltd. Circuit for protecting traveling-wave tubes against faults of a power supply. 4,323,853, Cl. 330-43.000.

Kushi, Kenji: *See*—
Sasaki, Isao; and Kushi, Kenji, 4,323,592, Cl. 427-54.100.

Kuwakado, Satosi: *See*—
Tsuge, Noboru; Kuwakado, Satosi; and Shimogawa, Toshiaki, 4,323,205, Cl. 242-107.40A.

Kuxin, Anatoly N.: *See*—
Veselovsky, Roman A.; Kuxin, Anatoly N.; Mudrov, Oleg A.; and Roitenberg, Yakov I., 4,323,491, Cl. 524-144.000.

Kuzmin, Viktor V.: *See*—
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.

Kuznetsov, Eduard B.: *See*—
Alekhin, Stanislav A.; Kuznetsov, Eduard B.; Bakhir, Vitold M.; Klimenko, Vladimir I.; and Zadorozhny, Jury G., 4,323,445, Cl. 204-300.00R.

Kwong, Gary W. Y., to UOP Inc. Preparation of polymeric reaction products of poly(alkoxyalkylene)amines and epihalohydrins. 4,323,709, Cl. 564-476.000.

Ladd, Floyd R.: *See—*
Townsend, Ray T.; and Ladd, Floyd R., 4,322,871, Cl. 17-1.00F.

Lade, Robert W.: *See—*
Schutten, Herman P.; Jaskolski, Stanley V.; Spellman, Gordon B.; Lade, Robert W.; and Schutten, Michael J., 4,323,793, Cl. 307-252.00R.

Lagana', Vincenzo; Saviano, Francesco; and Ferrantino, Stanislad, to Snamprogetti S.p.A. Gland seal system for use with a methanation reactor. 4,323,252, Cl. 277-12.000.

Laidig, Manfred R.: *See—*
Jones, Gary D.; Laidig, Manfred R.; and Weisz, William, 4,323,024, Cl. 112-237.000.

Laird, Edwin C.: *See—*
Mahato, Basanta K.; and Laird, Edwin C., 4,323,470, Cl. 252-182.100.

Lam, Hon W., to Texas Instruments Incorporated. Method of producing monocrystal on insulator. 4,323,417, Cl. 156-613.000.

Lampe, Robert F., to United States of America, Energy. Method of fabricating a prestressed cast iron vessel. 4,322,880, Cl. 29-452.000.

Landen, Ernest W.: *See—*
Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., 4,323,401, Cl. 148-39.000.

Landry, Joseph E.: *See—*
Carriere, Joseph F.; Gaunt, Wilmer B., Jr.; Landry, Joseph E.; and Spires, Dewayne A., 4,323,885, Cl. 340-347.0CC.

Langer, Alois A., to Mirowski, Mieczyslaw. Battery failure compensation for a power supply used in an implantable defibrillator. 4,323,075, Cl. 128-419.00D.

Lansberry, Delbert B. Target game. 4,323,250, Cl. 273-400.000.

Lansberry, John B.; Apt, Jerome, Jr.; and Dury, Joseph D., Jr., to Coalex, Inc. Remote controlled high wall coal mining system. 4,323,280, Cl. 299-1.000.

Lantin, Patrice; and Pere, Gerard, to Creusot-Loire. Electrolysis installation for the production of gas. 4,323,442, Cl. 204-237.000.

LaPierre, Donald C.: *See—*
Shedd, Walter M.; and LaPierre, Donald C., 4,323,851, Cl. 328-72.000.

LaSalle Machine Tool, Inc.: *See—*
Wiknich, Douglas D., 4,323,152, Cl. 198-751.000.

Lasker, George; and Redman, Paul G., to General Dynamics, Pomona Division. Gyroscope cage system for high g environments. 4,322,984, Cl. 74-51.000.

Lathrope, Michael F., to Motorola, Inc. Low transient feedthru FET sample and hold gate. 4,323,796, Cl. 307-353.000.

Latimer, John P., to Deepsea Ventures, Inc. Balanced support plates. 4,323,216, Cl. 248-550.000.

Laurel Bank Machine Co., Ltd.: *See—*
Uchida, Shinya, 4,323,768, Cl. 235-92.0SB.

Lautenschlager, Gerhard W., to Karl Lautenschlager KG., Mobelbeschlagfabrik. Hinge for all-glass doors of cabinets. 4,322,870, Cl. 16-235.000.

Laverty, Gerald C., to Cosco Industries, Inc. Adaptor core. 4,323,202, Cl. 242-68.500.

Lay, Roger F.: *See—*
Holtz, Earl B.; Lay, Roger F.; Manduley, Flavio M.; and Moody, Howard J., 4,323,987, Cl. 365-229.000.

Lazzari, Jean P., to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Process, magnetic transducer and system for generating a magnetic induction field within a magnetic medium. 4,323,940, Cl. 360-113.000.

Lazzari, Jean-Pierre; and Desserre, Jacques, to Compagnie International pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Integrated magnetic transducer. 4,323,941, Cl. 360-123.000.

Le Materiel Telephonique Thomson-CSF: *See—*
Houdard, Jean-Pierre; Julie, Jean-Jacques; and Leoni, Bernard G., 4,323,980, Cl. 364-724.000.

Leach, John M., to Gould Advance Limited. Power regulating apparatus including load current sensor means. 4,323,845, Cl. 323-224.000.

Lebedev, Vladimir K.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galyan, Boris A., 4,323,752, Cl. 219-101.000.

Lederer, Hans: *See—*
Knuppertz, Heinz W.; and Lederer, Hans, 4,323,029, Cl. 118-231.000.

Lee, Cheuk M.: *See—*
Ours, Carroll W.; and Lee, Cheuk M., 4,323,691, Cl. 560-36.000.

Lee, Chin K.: *See—*
Long, Margaret E.; and Lee, Chin K., 4,323,651, Cl. 435-207.000.

Lee, David M.; Rose, Donald K.; and Clover, Richmond B., to Intel Magnetics, Inc. Magnetic bubble detector. 4,323,983, Cl. 365-8.000.

Lee, Francis C.; Mills, Ross N.; and Talke, Frank E., to International Business Machines Corp. Resonant purging of drop-on-demand ink jet print heads. 4,323,908, Cl. 346-140.00R.

Lee, Maw H., to Scott & Fetzer Company, The. Simplified power factor controller for induction motor. 4,323,835, Cl. 318-729.000.

Lee, Tien P.: *See—*
Campbell, Joe C.; and Lee, Tien P., 4,323,911, Cl. 357-30.000.

Lefrancier, Pierre: *See—*
Audibert, Francoise; and Lefrancier, Pierre, 4,323,559, Cl. 424-177.000.

Lehman, Frederick D., to CPT Corporation. Drive circuits for a high resolution cathode ray tube display. 4,323,826, Cl. 315-408.000.

Lehmann, Jr. Ernst. Spray coating device. 4,323,030, Cl. 118-309.000.

Leiby, Clare C., Jr.; and Ezekiel, Shaoul, to United States of America, Air Force. Laser excited molecular beam time and frequency standard. 4,323,860, Cl. 372-32.000.

Leistner, Werner, to Siemens Aktiengesellschaft. Bundle of laminations for an electric machine. 4,323,802, Cl. 310-59.000.

Leitgeb, Paul, to Linde Aktiengesellschaft. Adsorption process producing varying amounts of product gas of a constant purity. 4,323,370, Cl. 55-18.000.

Lemke, Andreas, to Auergesellschaft GmbH. Switching circuit for monitoring the switching state of switch elements. 4,323,890, Cl. 340-524.000.

Lenoir, John: *See—*
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,323,682, Cl. 544-353.000.

Lenthall, Frank C., to F. L. Plastics Industries Pty. Ltd. Indicators for garment hangers. 4,322,902, Cl. 40-322.000.

Lentz, David J.; and Pollock, Elisabeth M., to Vascor, Inc. Method for inhibiting mineralization of natural tissue during implantation. 4,323,358, Cl. 8-94.110.

Leoni, Bernard G.: *See—*
Houdard, Jean-Pierre; Julie, Jean-Jacques; and Leoni, Bernard G., 4,323,980, Cl. 364-724.000.

L'Etat Francais, represente par le Secretaire d'Etat aux Poste et Telecommunications (Centre National d'Etudes des Telecommunications): *See—*
Guillou, Louis C., 4,323,921, Cl. 358-114.000.

Leung, Danton K.; and Singh, Prithipal, to Syva Company. Valproate conjugation using dicarbonyls. 4,323,507, Cl. 260-345.90R.

Levason, William: *See—*
McAuliffe, Charles A.; Levason, William; and McCullough, Francis P., 4,323,543, Cl. 423-219.000.

Lever Brothers Company: *See—*
Curry, Janet C.; and Bory, Barbara H., 4,323,466, Cl. 252-106.000.

Leverich, George C. Foot protector for furniture. 4,323,610, Cl. 428-68.000.

Levinson, Steven R., to Eastman Kodak Company. Stable photographic developers containing an indazole antifoggant and a lignosulfonate. 4,323,642, Cl. 430-438.000.

Levinstein, Hyman J.: *See—*
Adams, Arthur C.; Alexander, Frank B., Jr.; Levinstein, Hyman J.; and Thibault, Louis R., 4,323,638, Cl. 430-275.000.

Lewis, Norris E.; and Walker, Herbert C., to Litton Systems, Inc. High voltage slip ring assembly. 4,323,292, Cl. 339-5.00M.

Lewis, William P.: *See—*
Compton, Donald B.; Lewis, William P.; and Trinh, Toan, 4,323,193, Cl. 239-44.000.

Li, Chou H. Powder metallurgy process and product. 4,323,395, Cl. 75-212.000.

LIBA Maschinenfabrik GmbH: *See—*
Wunner, Roland, 4,322,956, Cl. 66-203.000.

Libbey-Owens-Ford Company: *See—*
McComb, Walter D.; and Rudolph, Andrew W., 4,323,785, Cl. 250-461.00R.

Liebrich, Wolfgang; and Schneider, Dieter, to Odenwalder Kunststoffwerke GmbH. Light-reflecting arrangement for use in traffic control devices. 4,323,320, Cl. 404-10.000.

Liedtke, Ronald: *See—*
Jernstrom, Hans E. I.; Long, Thomas L.; and Liedtke, Ronald, 4,323,238, Cl. 273-1.00G.

Life Savers, Inc.: *See—*
Vink, Walter; Spooner, Leonard; and Mackay, Donald A. M., 4,323,588, Cl. 426-564.000.

Lightolier Incorporated: *See—*
Florence, Noel S.; and Lynn, Norman, 4,323,954, Cl. 362-267.000.

Ligorati, Ferdinando: *See—*
Canavesi, Roberto; Ligorati, Ferdinando; and Aglietti, Giancarlo, 4,323,716, Cl. 570-243.000.

Likins, Robert W., to American Can Company. Power transfer system. 4,323,748, Cl. 219-10.710.

Lim, Ho S. Liquid container with cup holder. 4,323,172, Cl. 222-130.000.

Lim, Teong C.: *See—*
De Wames, Roger E.; Hall, William F.; Ho, William W.; and Lim, Teong C., 4,323,901, Cl. 343-754.000.

Lincoln, Frank H.: *See—*
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,672, Cl. 542-421.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,673, Cl. 542-426.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,674, Cl. 542-426.000.

Linde Aktiengesellschaft: *See—*
Leitgeb, Paul, 4,323,370, Cl. 55-18.000.
Muller, Karl-Heinz; and Forg, Wolfgang, 4,323,380, Cl. 62-28.000.

Link, Edwin A., to RTE Corporation. Blown fuse indicator. 4,323,874, Cl. 337-244.000.

Lipperts, Joseph H., to Hazemeijer B. V. Method for improving switch contacts, in particular for vacuum switches. 4,323,590, Cl. 427-38.000.

List, Hans: *See—*
Pomfret, Colin T., 4,323,253, Cl. 277-12.000.

Litton Business Systems, Inc.: *See—*
Johnston, John N., 4,323,979, Cl. 364-708.000.

Litton Systems, Inc.: *See—*
Carpenter, Lowell L., 4,323,773, Cl. 235-473.000.

Lewis, Norris E.; and Walker, Herbert C., 4,323,292, Cl. 339-5.00M.
Ljuty, Boris I.: *See*—
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.
Loch, David M., to Boeing Company, The. Anodizing process employing adjustable shield for suspended cathode. 4,323,433, Cl. 204-56.00R.
Lockheed Missiles & Space Company, Inc.: *See*—
Spilker, James J., Jr., 4,324,002, Cl. 455-27.000.
Lodewyck, Paul D.: *See*—
Montle, John F.; Markowski, Henry J.; Lodewyck, Paul D.; and Schneider, Daniel F., III, 4,323,690, Cl. 556-470.000.
Logue, Gerald W.; and Schnepel, Rudolph R. Paint spraying apparatus. 4,323,196, Cl. 239-532.000.
Long, Florren E., to Ludlow Corporation. Thermally-processable flexible package and process for using same. 4,323,586, Cl. 426-412.000.
Long, Margaret E.; and Lee, Chin K., to R. J. Reynolds Tobacco Company. Thermostable lactase derived from bacillus. 4,323,651, Cl. 435-207.000.
Long, Thomas L.: *See*—
Jernstrom, Hans E. I.; Long, Thomas L.; and Liedtke, Ronald, 4,323,238, Cl. 273-1.00G.
Longinotti, Alfredo, to Centro Di Ricera Enrico Longinotti Firenze S.p.A. Apparatus to provide an even layer or loose material to a suction conveyor. 4,323,178, Cl. 222-415.000.
Look, Christopher M.: *See*—
Noad, Julian P.; Springthorpe, Anthony J.; and Look, Christopher M., 4,323,859, Cl. 372-46.000.
L'Oreal: *See*—
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,323,549, Cl. 424-45.000.
Bouillon, Claude; and Darmenton, Patrick, 4,323,553, Cl. 424-61.000.
Bugaut, Andree; and Junino, Alex, 4,323,360, Cl. 8-407.000.
Grollier, Jean-Francois; and Allec, Josiane, 4,323,468, Cl. 252-174.170.
Lorenzen, Heinz-Christen: *See*—
Helms, Adolf; and Lorenzen, Heinz-Christen, 4,323,082, Cl. 131-281.000.
Lorke, Horst: *See*—
Helwerth, Rainer; and Lorke, Horst, 4,323,476, Cl. 252-389.00R.
Loveland, William A.; Dukes, James S.; and Sparks, Gregory W. Target holder. 4,323,251, Cl. 273-407.000.
Lowery, Kirby, Jr.; Birkelbach, Donald F.; and Shipley, Randall S., to Dow Chemical Co., The. High efficiency catalyst for polymerizing olefins. 4,323,665, Cl. 526-122.000.
Lowry, Elvery D.: *See*—
Wyner, Elliot F.; and Lowry, Elvery D., 4,323,812, Cl. 313-198.000.
Lucas, Bruce T., to United States of America, Navy. Automatic target screening. 4,323,880, Cl. 340-146.3AC.
Lucas Industries Limited: *See*—
Hill, William F., 4,323,944, Cl. 361-152.000.
Lumby, Roland J.; North, Bernard; Taylor, Alfred J.; and Thomas, Roland M., 4,323,323, Cl. 407-119.000.
Woodhouse, Richard G.; and Williams, Malcolm, 4,323,042, Cl. 123-436.000.
Luderer, Albert A.: *See*—
Borrelli, Nicholas F.; Luderer, Albert A.; and Panzarino, Joseph N., 4,323,056, Cl. 128-1.300.
Ludlow Corporation: *See*—
Long, Florren E., 4,323,586, Cl. 426-412.000.
Lugosi, Gyorgy; May, Antal S.; Bodnar, Janos; Turcsan, Istvan; Jelinek, Istvan; Somfai, Eva; and Simandi, Laszlo, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Process for O-acylating phenol derivatives and acylating compositions for this purpose. 4,323,469, Cl. 252-182.000.
Lukac, Teodor; Widmer, Erich; and Zell, Reinhard, to Hoffmann-La Roche Inc. Process for producing cyclohexenes. 4,323,711, Cl. 568-347.000.
Lukaszczyk, Alfons: *See*—
Pissiotas, Georg; Durr, Dieter; Rohr, Otto; and Lukaszczyk, Alfons, 4,323,388, Cl. 71-88.000.
Lumby, Roland J.; North, Bernard; Taylor, Alfred J.; and Thomas, Roland M., to Lucas Industries Limited. Tool tip for a machine tool. 4,323,323, Cl. 407-119.000.
Lund, John A.: *See*—
den Toonder, Pieter; Doles, Glenn P.; Lund, John A.; Merrell, Richard G.; and Stubbs, Graham S., 4,323,922, Cl. 358-117.000.
Lunn, John G., to Geo. A. Hormel & Company. Hind leg skinner. 4,322,873, Cl. 17-21.000.
Lunsford, Delbert R.: *See*—
Parrack, Alvin L.; and Lunsford, Delbert R., 4,323,876, Cl. 367-40.000.
Lutz, Alfons: *See*—
Rengstl, Johann; and Lutz, Alfons, 4,323,277, Cl. 296-216.000.
Lutz, Charles W.: *See*—
Downey, Gale D.; and Lutz, Charles W., 4,323,465, Cl. 252-102.000.
Lutz, Horst, to Daimler-Benz Aktiengesellschaft. Straightener for motor vehicles. 4,323,228, Cl. 269-296.000.
Lutz, Rainer M. Sun visor with auxiliary visors. 4,323,275, Cl. 296-97.00G.
Luzynski, Anthony J. Security device for motor vehicles and other d.c. electrical systems. 4,323,878, Cl. 340-63.000.
Lynn, Norman: *See*—
Florence, Noel S.; and Lynn, Norman, 4,323,954, Cl. 362-267.000.
Maag Gear-Wheel & Machine Co. Ltd.: *See*—
Guenter, Erwin, 4,322,889, Cl. 33-179.50R.
Macaulay, John G., to Toppy's Salons Limited. Mounting devices. 4,323,212, Cl. 248-51.000.
Mackay, Donald A. M.: *See*—
Vink, Walter; Spooner, Leonard; and Mackay, Donald A. M., 4,323,588, Cl. 426-564.000.
Mackey, William H.; and Smith, Lee R. Trophy support column. 4,323,630, Cl. 428-542.000.
MacKinnon, John W. M.: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; MacKinnon, John W. M.; Judd, Duncan B.; and Carey, Linda, 4,323,566, Cl. 424-248.510.
Madden, Thomas H.; and Reash, Clair W., to Union Carbide Corporation. Getter construction for reducing the arc discharge current in color TV tubes. 4,323,818, Cl. 313-481.000.
Maegawa, Yuzo: *See*—
Takahashi, Masatoshi; Kotera, Norio; Uegaki, Masatoshi; Miyaoka, Takashi; and Maegawa, Yuzo, 4,323,431, Cl. 203-72.000.
Maerfeld, Charles; and Gautier, Herve, to Thomson-CSF. Two dimensional acousto-electrical device for storing and processing information. 4,323,985, Cl. 365-157.000.
Maeroff, Bruce J., to Ford Motor Company. Filler pipe seal with fill control skirt. 4,323,166, Cl. 220-86.00R.
Magder, Jules, to Noxso Corporation. Process and sorbent system for removing nitrogen and other oxides from gas streams. 4,323,544, Cl. 423-239.000.
Magdo, Ingrid E.: *See*—
Abbas, Shakir A.; and Magdo, Ingrid E., 4,322,883, Cl. 29-578.000.
Magi, Hugo, to Bronardi Inc. Apparatus for aerating liquids. 4,323,090, Cl. 141-70.000.
Magnetics International, Inc.: *See*—
Chlad, Kenneth J., 4,323,329, Cl. 414-737.000.
Mahato, Basanta K.; and Laird, Edwin C., to Globe-Union Inc. Battery paste for lead-acid storage batteries. 4,323,470, Cl. 252-182.100.
Maier, Edward E.: *See*—
Glassman, Donald; and Maier, Edward E., 4,323,430, Cl. 203-7.000.
Maier, Peter. Eccentric plate grinder. 4,322,921, Cl. 5-170.0MT.
Makabe, Hachiro: *See*—
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, 4,323,833, Cl. 318-376.000.
Malaviva, Shashi D., to International Business Machines Corporation. Electronic storage array having DC stable conductivity modulated storage cells. 4,323,986, Cl. 365-174.000.
Malcik, Frank J.: *See*—
Clark, John P.; Michaelis, Jack H.; and Malcik, Frank J., 4,323,318, Cl. 402-17.000.
Mallory, William R.: *See*—
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,323,679, Cl. 544-256.000.
Malloy, Thomas P.; and Engel, Dusan J., to UOP Inc. Alkylation of hydroxy-substituted aromatic compounds. 4,323,714, Cl. 568-766.000.
Malloy, Thomas P.: *See*—
Engel, Dusan J.; and Malloy, Thomas P., 4,323,715, Cl. 568-766.000.
Malthouse, Martin D.; and Groeger, Heinz K. Labelling equipment. 4,323,416, Cl. 156-521.000.
Maltzman, Edward; and Erikson, Herman E. Novel teaching method and apparatus. 4,323,349, Cl. 434-184.000.
Mandai, Harufumi; and Nishimura, Kunitaro, to Murata Manufacturing Co., Ltd. Semiconductor ceramic composition for boundary layer capacitors. 4,323,617, Cl. 428-148.000.
Manduley, Flavio M.: *See*—
Holtz, Earl B.; Lay, Roger F.; Manduley, Flavio M.; and Moody, Howard J., 4,323,987, Cl. 365-229.000.
Manfra, Michael J.: *See*—
Calawa, Arthur R.; Gormley, Joseph V.; and Manfra, Michael J., 4,323,422, Cl. 156-636.000.
Manicardi, Emidio: *See*—
Grilli, Walter; Manicardi, Emidio; and Ferrari, Ivano, 4,323,185, Cl. 228-114.000.
Mannschreck, William A.: *See*—
Dennis, Dwight L.; and Mannschreck, William A., 4,323,000, Cl. 89-36.00A.
Manser, Josef, to Gebrueder Buehler A.G. Process for the production of pasta products packed ready for sale in serving portions in packages. 4,323,585, Cl. 426-394.000.
Marcolongo, Samuel. Tool for trimming willow trees. 4,322,886, Cl. 30-312.000.
Marconi Company Limited, The: *See*—
Bridges, Clive A.; and O'Donnell, Patrick J., 4,323,776, Cl. 250-332.000.
Marconi Instruments Limited: *See*—
Arnold, Victor F.; and Dixon, Roger C., 4,323,943, Cl. 361-114.000.
Marconi, Joseph. Printed circuit card retainer and rack assembly. 4,323,161, Cl. 211-41.000.
Margotte, Dieter: *See*—
Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,323,501, Cl. 260-333.000.

Mark Controls Corporation: *See*—
Nordeen, Howard C., 4,323,112, Cl. 165-27.000.
Mark, Edward H. Light with 360° rotatable cover. 4,323,955, Cl. 362-278.000.
Markova, Marie: *See*—
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.
Markowski, Henry J.: *See*—
Montle, John F.; Markowski, Henry J.; Lodewyck, Paul D.; and Schneider, Daniel F., III, 4,323,690, Cl. 556-470.000.
Marley Tile AG: *See*—
Cooper, Christopher A., 4,322,924, Cl. 52-57.000.
Marmorat, Andre; and Robert, Arnold-Michel, to Framatome. Device for feeding, with elongate lining material, an installation for lining a tubular member. 4,323,750, Cl. 219-76.100.
Marola, America E.: *See*—
Stella, Leo; and Marola, America E., 4,323,287, Cl. 308-187.100.
Marshall, David W., to Kennecott Corporation. Method for achieving particle-to-particle contact in an antifouling coating. 4,323,599, Cl. 427-181.000.
Martin-Smith, Michael: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; MacKinnon, John W. M.; Judd, Duncan B.; and Carey, Linda, 4,323,566, Cl. 424-248.510.
Martini, Thomas: *See*—
Eckes, Helmut; Erckel, Rudiger; Martini, Thomas; and Rosch, Gunter, 4,323,675, Cl. 542-463.000.
Martinsen, Nick: *See*—
Tombaugh, Dennis; Martinsen, Nick; Symmons, Edgar B.; and Heinz, Lothar, 4,323,780, Cl. 250-419.000.
Maruyama, Eiichi: *See*—
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.
Marvel, John T.: *See*—
D'Amico, John J.; and Marvel, John T., 4,323,686, Cl. 548-165.000.
Marvin Glass & Associates: *See*—
Hanson, Steven P.; Morrison, Howard J.; and Montague, Douglas P., 4,323,243, Cl. 273-153.00S.
Holahan, Edward T.; and Meyer, Burton C., 4,322,909, Cl. 46-14.000.
Marx, Michael: *See*—
Fried, John H.; Kertesz, Denis J.; and Marx, Michael, 4,323,564, Cl. 424-241.000.
Maschinen- und Armaturen- J & W Muller, fabrik GmbH: *See*—
Noll, Hans, 4,323,223, Cl. 266-54.000.
Maschinenfabrik Fr. Niepmann & Co.: *See*—
Niepmann, Otto, 4,322,931, Cl. 53-449.000.
Masclet, Jean; and Veaux, Jacques, to Messier-Hispano-Bugatti. Operating and bracing jack having an internal locking mechanism. 4,323,001, Cl. 91-25.000.
Masegi, Koichi: *See*—
Kawamura, Naoto; Masegi, Koichi; Hakamada, Isao; Uchiyama, Haruo; Kitamura, Takashi; and Ishii, Masaaki, 4,323,297, Cl. 350-6.800.
Maslennikov, Konstantin N.: *See*—
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.
Masnari, Nino A.; Rensel, Walter B.; Robinson, Merrill G.; Solomon, David E.; Wise, Kensall D.; and Wuttke, Gilbert H., to United States of America, Energy. Process for manufacture of inertial confinement fusion targets and resulting product. 4,323,420, Cl. 156-628.000.
Massachusetts Institute of Technology: *See*—
Hammond, Ogden H., 4,323,368, Cl. 48-202.000.
Massie, Lewis E.: *See*—
Flesher, Richard H.; and Massie, Lewis E., 4,323,016, Cl. 108-51.100.
Masuda, Yoshinori: *See*—
Yoshida, Mitsuo; Masuda, Yoshinori; and Kashiwada, Akio, 4,323,434, Cl. 204-98.000.
Matsui, Kazumasa: *See*—
Iwabuchi, Suminobu; and Matsui, Kazumasa, 4,323,620, Cl. 428-215.000.
Matsui, Masakuni: *See*—
Tsugekawa, Takanori; Banba, Tosio; and Matsui, Masakuni, 4,323,039, Cl. 123-275.000.
Matsui, Motomu: *See*—
Muramoto, Ei-ichi; and Matsui, Motomu, 4,323,283, Cl. 305-10.000.
Matsumoto, Yoshihisa: *See*—
Okada, Mitsuo; Nagoshi, Eiichi; and Matsumoto, Yoshihisa, 4,323,326, Cl. 411-412.000.
Matsumura, Yukio: *See*—
Itoi, Eiji; Nakayama, Takashi; Nakao, Makoto; and Matsumura, Yukio, 4,323,436, Cl. 204-98.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hattori, Masumi; Ishida, Toru; and Tanaka, Shinichi, 4,323,484, Cl. 252-521.000.
Kunieda, Toshiaki; Odagiri, Masaru; Fujita, Takashi; and Shinohara, Koichi, 4,323,629, Cl. 428-457.000.
Nichimoto, Susumu; Shinoda, Isao; Nakamura, Shigeo; and Tsumura, Haruhide, 4,323,148, Cl. 194-100.00A.
Tsunashima, Eiichi, 4,323,593, Cl. 427-97.000.
Matsushita Electric Works, Ltd.: *See*—
Sauer, Hans, 4,323,945, Cl. 361-160.000.
Matsuura, Toshitaka: *See*—
Takami, Akio; Matsuura, Toshitaka; and Saito, Tsutomu, 4,322,968, Cl. 73-27.00R.
Matsuyama, Iwao; Susa, Kenzo; Suganuma, Tsuneo; Satoh, Shin; Katsuyama, Toshio; and Obayashi, Hidehito, to Hitachi, Ltd. Method for producing mother rods for optical fibers. 4,323,381, Cl. 65-32.000.
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with 2-substituted-alkyl-5-substituted-N,N-dimethylcarbamic acid O-pyrimidin-6-yl esters. 4,323,571, Cl. 424-251.000.
Maurer, Helmut: *See*—
Wossner, Gunter; and Maurer, Helmut, 4,322,947, Cl. 60-285.000.
Maurer, Werner, to Karl M. Reich Maschinenfabrik GmbH, Firma. Apparatus for filling the magazine of a fastener driver. 4,323,184, Cl. 227-120.000.
May, Antal S.: *See*—
Lugosi, Gyorgy; May, Antal S.; Bodnar, Janos; Turcsan, Istvan; Jelinek, Istvan; Somfai, Eva; and Simandi, Laszlo, 4,323,469, Cl. 252-182.000.
Mayo, Terry H.: *See*—
Childers, John S.; and Mayo, Terry H., 4,323,284, Cl. 308-8.200.
Mazanek, Jan; Gipp, Roland; Zollner, Robert; Seifert, Peter; Wagner, Kuuno; and Blahak, Johannes, to Bayer Aktiengesellschaft. Dispersions of high melting polyesters in polyhydroxyl compounds, a process for their preparation and their use in the production of polyurethanes. 4,323,657, Cl. 521-116.000.
Mazond, Michel P.; and Wavre, Alain, to Ateliers des Charmilles, S.A. Process and apparatus for machining by electrical discharges along a slant axis. 4,323,749, Cl. 219-69.00M.
McAuliffe, Charles A.; Levason, William; and McCullough, Francis P., to National Research Development Corporation. Sorption of gases. 4,323,543, Cl. 423-219.000.
McClellan, William F., to Pipe Shields, Inc. Insulating pipe support. 4,323,088, Cl. 138-106.000.
McComb, Walter D.; and Rudolph, Andrew W., to Libbey-Owens-Ford Company. Method of and apparatus for observing sheet surfaces for traces of fluorescent materials thereon. 4,323,785, Cl. 250-461.00R.
McCorkle, John W.: *See*—
Krall, Albert D.; McCorkle, John W.; Scarzello, John F.; and Syeles, Albert M., 4,323,900, Cl. 343-700.0MS.
McCrory, Roy E. Animated wildfowl decoy. 4,322,908, Cl. 43-3.000.
McCullough, Francis P.: *See*—
McAuliffe, Charles A.; Levason, William; and McCullough, Francis P., 4,323,543, Cl. 423-219.000.
McCullough, Robert W.; and Hewett, Thomas A., to Union Carbide Corporation. Solar heater with integral heat trap glazing. 4,323,053, Cl. 126-441.000.
McDonald, Charles J. Device for gathering fruit. 4,322,939, Cl. 56-328.00R.
McDonnell Douglas Corporation: *See*—
Ahrens, Robert O.; and Merkel, Jerry L., 4,323,623, Cl. 428-246.000.
McGarrity, James M.; and Boesch, Harold E., Jr., to United States of America, Army. Method and apparatus for electrically testing radiation susceptibility of MOS gate devices. 4,323,842, Cl. 324-158.00R.
McGaughey, Donald C., to State Wide Aluminum of Indiana, Inc. Slideable closure construction. 4,322,914, Cl. 49-370.000.
McGee, Lawrence: *See*—
Garner, Henry C.; and McGee, Lawrence, 4,323,717, Cl. 373-101.000.
McGregor, Harold R. Bag filling and handling apparatus. 4,322,932, Cl. 53-505.000.
McGurk, Stanley E.: *See*—
Cowan, Wavell F.; Green, Marshall S.; and McGurk, Stanley E., 4,323,426, Cl. 162-398.000.
McIlvried, Howard G., III: *See*—
Tsai, Shirley C.; and McIlvried, Howard G., III, 4,323,447, Cl. 208-8.0LE.
McIntosh, James K.; and Numata, M., to Carolina Enterprises, Inc. Automatic ball pitching machine. 4,323,047, Cl. 124-1.000.
McKenney, John D.: *See*—
Dana, William R.; Friedrich, Ralph S.; and McKenney, John D., 4,323,408, Cl. 156-175.000.
McMillin, Danny L.; and Stirbis, James S., to Coors Container Company. Method for printing cans from heat transfer paper. 4,323,601, Cl. 427-287.000.
McQuitty, Jim B.: *See*—
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.
Medtronic, Inc.: *See*—
Nelms, George E., 4,323,074, Cl. 128-419.0PG.
Wiebusch, Wendy A., 4,323,081, Cl. 128-785.000.
Megadata Corporation: *See*—
Cole, James A., 4,323,888, Cl. 340-365.00A.
Megles, John E., Jr.: *See*—
Holland, Hans J.; and Megles, John E., Jr., 4,323,653, Cl. 501-32.000.
Mehlan, Bernd: *See*—
Kolbl, Richard; and Mehlan, Bernd, 4,323,147, Cl. 194-48.000.
Meinan Machinery Works, Inc.: *See*—
Ibuki, Yasuhiro, 4,323,616, Cl. 428-134.000.

Meininger, Fritz: *See—*
Hoyer, Ernst; Meininger, Fritz; and Fass, Rudolf, 4,323,497, Cl. 260-146.00T.
Melgaard, Hans L.; and Mercier, Gary H., to Despatch Industries, Inc. Gas analyzer calibration apparatus. 4,322,964, Cl. 73-1.00G.
Melhart, Albert H. Ankle stress machine. 4,323,080, Cl. 128-774.000.
Menson, Robert C.: *See—*
Adams, Thomas H.; Beck, James P.; and Menson, Robert C., 4,323,478, Cl. 252-408.000.
Mercer, Douglas A.: *See—*
Holloway, Peter R.; and Mercer, Douglas A., 4,323,795, Cl. 307-297.000.
Mercier, Gary H.: *See—*
Melgaard, Hans L.; and Mercier, Gary H., 4,322,964, Cl. 73-1.00G.
Mercier, George E.; Pickett, John H.; and Holtzman, Barry L., to Westinghouse Electric Corp. Capacitor structures with improved electrical stress capability. 4,323,948, Cl. 361-315.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Bernhard, Horst, 4,323,554, Cl. 424-63.000.
Merkel, Jerry L.: *See—*
Ahrens, Robert O.; and Merkel, Jerry L., 4,323,623, Cl. 428-246.000.
Merrell, Richard G.: *See—*
den Toonder, Pieter; Doles, Glenn P.; Lund, John A.; Merrell, Richard G.; and Stubbs, Graham S., 4,323,922, Cl. 358-117.000.
Merrell Toraude et Compagnie: *See—*
Metcalf, Brian W.; Jung, Michel; and Danzin, Charles, 4,323,704, Cl. 562-561.000.
Merrick, Llewellyn S., to Oros Corporation. Portable telephone line test set. 4,323,738, Cl. 179-175.10R.
Merten, Rudolf; and Rottmaier, Ludwig, to Bayer Aktiengesellschaft. Process for the preparation of 1,2,4-triazolidine-3,5-dione. 4,323,687, Cl. 548-264.000.
Merz & Co.: *See—*
Scherm, Arthur, 4,323,548, Cl. 424-44.000.
Messier-Hispano-Bugatti: *See—*
Masclet, Jean; and Veaux, Jacques, 4,323,001, Cl. 91-25.000.
Metalwash Machinery Corp.: *See—*
Nolte, Robert K.; Rath, Robert E.; and Jarvis, Michael F., 4,323,091, Cl. 134-60.000.
Metcalf, Brian W.; Jung, Michel; and Danzin, Charles, to Merrell Toraude et Compagnie. αAcetylene and α-vinyl derivatives of amino acids. 4,323,704, Cl. 562-561.000.
Meunier, Georges, to Isover Saint-Gobain. Preheater for compacted vitrifiable material. 4,323,384, Cl. 65-335.000.
Meus, Roger R., to Ordibel Sprl. Machines for assembling sheets of laminar material such as paper. 4,323,229, Cl. 270-58.000.
Meyer, Burton C.: *See—*
Holahan, Edward T.; and Meyer, Burton C., 4,322,909, Cl. 46-14.000.
Meyer, Chantal C.: *See—*
Bloch, Bertrand; Meyer, Chantal C.; and Charrier, Denis, 4,323,695, Cl. 560-145.000.
Meyer-Kahrweg, Helmut, to Steag Aktiengesellschaft. Fluidized bed firing unit. 4,323,037, Cl. 122-4.00D.
Meyer, Leonard S., to Victor United, Inc. Method and apparatus for simultaneously molding a plurality of parts. 4,323,415, Cl. 156-433.000.
Meyer, Nicolas; and Foulon, Raymond, to Societe Chimique des Charbonnages SA. Boric anhydride solutions and their use as hardeners of resols. 4,323,667, Cl. 528-138.000.
Meyn, Pieter. Apparatus for breaking the neck of a fowl. 4,322,872, Cl. 17-12.000.
Michaelis, Jack H.: *See—*
Clark, John P.; Michaelis, Jack H.; and Malcik, Frank J., 4,323,318, Cl. 402-17.000.
Michiyama, Hideo: *See—*
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.
Middleton, William J., to Du Pont de Nemours, E. I., and Company. Fluorinated carbamate insecticides. 4,323,578, Cl. 424-298.000.
Midmark Corporation: *See—*
Clune, Charles A., 4,322,899, Cl. 37-86.000.
Mifune, Hiroyuki; Hirano, Shigeo; and Akimura, Yoshitaka, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials. 4,323,643, Cl. 430-441.000.
Mikame, Yoshio, to TDK Electronics Co., Ltd. Test system for detecting a permanent defect and a temporary defect in magnetic recording tape. 4,323,844, Cl. 324-212.000.
Mikkelsen, Erling H.: *See—*
Hansen, Niels H. V.; Mikkelsen, Erling H.; and Vissing, Soren, 4,323,474, Cl. 252-307.000.
Miles, Wilbur N.: *See—*
Benjamin, Milton L.; Miles, Wilbur N.; and Ecker, Samuel, 4,322,990, Cl. 82-3.000.
Miljoen, Rodney W., to James Howden Australia Pty. Limited. Clamping means. 4,323,378, Cl. 55-378.000.
Miller, Arthur F.: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,323,703, Cl. 562-546.000.
Miller, John A.: *See—*
Beuthling, Irvin C., 4,322,862, Cl. 6-5.000.
Miller, Michael B.: *See—*
Hussey, James L.; Miller, Michael B.; and Staker, William C., Jr., 4,323,902, Cl. 343-903.000.
Miller, Truman A.: *See—*
Remillard, Gerard J.; Cruz, Frank, Sr.; Devoss, Daniel W., Jr.; and Miller, Truman A., 4,322,992, Cl. 82-34.00R.
Milliken Research Corporation: *See—*
Greenway, John M.; and Bylund, Don M., 4,323,760, Cl. 219-364.000.
Mills, Ross N.: *See—*
Lee, Francis C.; Mills, Ross N.; and Talke, Frank E., 4,323,908, Cl. 346-140.00R.
Milner, David J., to Imperial Chemical Industries Limited. Process for the preparation of alkyl furans. 4,323,509, Cl. 260-346.110.
Minks, Werner, to ITT Industries, Inc. Armature mount for an electromagnetic relay. 4,323,869, Cl. 335-274.000.
Minnesota Mining and Manfacturing Company: *See—*
Brown, James N.; and Kalleberg, Melvin O., 4,322,875, Cl. 24-204.000.
Minnesota Mining and Manufacturing Company: *See—*
Beretta, Paolo, 4,323,633, Cl. 430-17.000.
Gebeke, Charles D., 4,323,207, Cl. 242-198.000.
Kubiatowicz, David O., 4,323,055, Cl. 128-1.200.
Rosso, Paul D.; and Moss, Michael Y., 4,323,557, Cl. 424-28.000.
Taylor, Allen L., 4,322,877, Cl. 29-25.350.
Wendling, Larry A.; and Covington, John B., 4,323,591, Cl. 427-53.100.
Mirowski, Mieczyslaw: *See—*
Langer, Alois A., 4,323,075, Cl. 128-419.00D.
Misawa, Makoto: *See—*
Ahagon, Asahiro; Misawa, Makoto; Miyasaka, Kazuo; and Hirakawa, Hiroshi, 4,323,485, Cl. 525-237.000.
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Gakh, Igor G.; Parbuzina, Iraida L.; Savitsky, Evgeny M.; Polyakova, Viktoria P.; and Roshan, Natalia R. Method for preparing 2,4-diaminolphenol or 2,4-diamonophenol dihydrochloride. 4,323,708, Cl. 564-418.000.
Mitani, Ikusaburo. Innoxious interferon-inducing substance, inducing agent and process for producing same. 4,323,496, Cl. 260-112.00R.
Mitchell, Hal D., to A-T-O Inc. Shoulder pad. 4,322,859, Cl. 2-2.000.
Mitsubishi Chemical Industries Limited: *See—*
Kikumoto, Kyoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, 4,323,568, Cl. 424-250.000.
Mori, Hazime; Kohyama, Katsuhisa; Nakamura, Katsuhiko; and Takamatsu, Shinichi, 4,323,519, Cl. 528-499.000.
Mori, Hazime; Kohyama, Katsuhisa; and Nakamura, Katsuhiko, 4,323,663, Cl. 525-470.000.
Okushima, Hiromi; Fujimori, Shinichiro; Furuya, Rikizo; and Hayakawa, Shuzo, 4,323,500, Cl. 260-239.570.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Nounen, Michiyasu; and Iwasaki, Yukio, 4,323,873, Cl. 337-186.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Hashimoto, Isao; and Nambu, Hirohiko, 4,323,505, Cl. 260-345.200.
Ohtani, Yoshitaka; and Nakagawa, Junichi, 4,323,432, Cl. 203-85.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,323,662, Cl. 525-281.000.
Sakata, Kenji; Yamada, Toshiaki; Uchiyama, Kenji; and Hasegawa, Yugo, 4,323,600, Cl. 427-202.000.
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.
Miyagishima, Tosh; and Motoda, Calvin, to Hydril Company. Front packer seal for ram blowout preventer. 4,323,256, Cl. 277-126.000.
Miyake, Makoto: *See—*
Kondo, Mitsuru; Iwasaki, Hiroshi; Yasui, Kiyoshi; and Miyake, Makoto, 4,323,700, Cl. 562-460.000.
Miyamoto, Koichi: *See—*
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Mohvama, Yoshikuni, 4,323,306, Cl. 355-15.000.
Miyaoka, Takashi: *See—*
Takahashi, Masatoshi; Kotera, Norio; Uegaki, Masatoshi; Miyaoka, Takashi; and Maegawa, Yuzo, 4,323,431, Cl. 203-72.000.
Miyasaka, Kazuo: *See—*
Ahagon, Asahiro; Misawa, Makoto; Miyasaka, Kazuo; and Hirakawa, Hiroshi, 4,323,485, Cl. 525-237.000.
Miyata, Junji: *See—*
Bando, Niro; Miyata, Junji; Tone, Masatsugu; and Watanabe, Haruo, 4,323,137, Cl. 180-305.000.
Miyazaki, Syouzi: *See—*
Kondo, Katsumi; Huwa, Yoshio; and Miyazaki, Syouzi, 4,323,257, Cl. 277-224.000.
Miyazawa, Takeshi; and Ono, Naotoshi, to Honda Giken Kogyo Kabushiki Kaisha. Snow blowing machine. 4,322,896, Cl. 37-43.00E.
Mnatsakanov, Suren S.: *See—*
Shirinian, Vram T.; Mnatsakanov, Suren S.; Pavljuchenko, Valery N.; Rozenberg, Mark E.; Gromov, Valery V.; and Ivanchev, Sergei S., 4,323,666, Cl. 526-329.000.
Mobil Oil Corporation: *See—*
Goode, James W.; Penner, Wayne A.; Ray, Charles D.; and Nelson, Robert G., 4,323,990, Cl. 367-21.000.
Haag, Werner O.; and Whitehurst, Darrell D., 4,323,698, Cl. 560-233.000.

Mochida, Haruo, to Nissan Motor Company, Limited. Locking means for a trunk in an automobile. 4,322,959, Cl. 70-241.000.
Mody, Dinesh I., to Instrumentation Laboratory Inc. Analysis system. 4,323,537, Cl. 422-63.000.
Mohawk Data Sciences Corp.: *See—*
Hayes, Robert S., 4,323,825, Cl. 315-387.000.
Mohvama, Yoshikuni: *See—*
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Mohvama, Yoshikuni, 4,323,306, Cl. 355-15.000.
Mojden, Wallace W., to Fleetwood Systems, Inc. Magnetic rail construction. 4,323,150, Cl. 198-690.000.
Molnlycke AB: *See—*
Ternstrom, Ingela M.; and Boman, Lars E., 4,323,070, Cl. 128-287.000.
Moltner, Hermann; and Siebenborn, Wolfgang, to Kocks Technik GmbH & Co. Adjustment means for stretch reduction rolling mills. 4,323,971, Cl. 364-469.000.
Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,323,010, Cl. 101-110.000.
Monji, Nobuo; and Castro, Albert, to University of Miami. Steric hindrance enzyme immunoassay. 4,323,647, Cl. 435-7.000.
Monma, Tetsuo: *See—*
Nishimura, Hiroshi; Monma, Tetsuo; Yoshida, Minoru; Kirimoto, Kazunari; Hayamizu, Yoshio; and Nagasawa, Toshio, 4,323,607, Cl. 219-213.000.
Monsanto Company: *See—*
Bramhall, George H., 4,323,533, Cl. 264-145.000.
Coran, Aubert Y.; and Patel, Raman, 4,323,625, Cl. 428-361.000.
D'Amico, John J., 4,323,677, Cl. 544-135.000.
D'Amico, John J.; and Marvel, John T., 4,323,686, Cl. 548-165.000.
Dutra, Gerard A., 4,323,387, Cl. 71-87.000.
Fritzsche, Alfred K.; Holladay, Harry P.; and Woodcock, Maurice L., 4,323,454, Cl. 210-321.100.
van Issum, Ernst J., 4,323,612, Cl. 428-89.000.
Zampini, Anthony, 4,323,453, Cl. 210-321.100.
Monson, Donald R.; and Camplin, Harry R., to Donaldson Company, Inc. Air cleaner and ventilator. 4,323,369, Cl. 55-1.000.
Montague, Douglas P.: *See—*
Hanson, Steven P.; Morrison, Howard J.; and Montague, Douglas P., 4,323,243, Cl. 273-153.00S.
Montedison S.p.A.: *See—*
Dal Moro, Anacleto; Pinamonti, Franco; and Capizzi, Amedeo, 4,323,556, Cl. 424-84.000.
Silvestrini, Vittorio; Peraldo, Mario; and Monza, Enrico, 4,323,619, Cl. 428-212.000.
Month, Alfred: *See—*
Benner, Timothy E.; and Month, Alfred, 4,323,814, Cl. 313-390.000.
Montle, John F.; Markowski, Henry J.; Lodewyck, Paul D.; and Schneider, Daniel F., III, to Carboline Company. Method of making silicate esters. 4,323,690, Cl. 556-470.000.
Monza, Enrico: *See—*
Silvestrini, Vittorio; Peraldo, Mario; and Monza, Enrico, 4,323,619, Cl. 428-212.000.
Moody, Howard J.: *See—*
Holtz, Earl B.; Lay, Roger F.; Manduley, Flavio M.; and Moody, Howard J., 4,323,987, Cl. 365-229.000.
Moore, Dana: *See—*
Johnson, Robert B.; Nibby, Chester M., Jr.; and Moore, Dana, 4,323,965, Cl. 364-200.000.
Morduchowitz, Abraham, to Texaco Inc. Secondary recovery process. 4,323,463, Cl. 252-8.55D.
Morello, Sergio. Manufacturing process for covering panels, and panels obtained with this process. 4,323,406, Cl. 156-91.000.
Morgenroth, Henri. Constant depression carburetor. 4,323,521, Cl. 261-50.00A.
Morhaim, Claude: *See—*
Baudry, Hugues; Morhaim, Claude; and Bricout, Dominique, 4,323,652, Cl. 501-17.000.
Mori, Hazime; Kohyama, Katsuhisa; Nakamura, Katsuhiko; and Takamatsu, Shinichi, to Mitsubishi Chemical Industries, Ltd. Method of washing organic solvent solution of polycarbonate. 4,323,519, Cl. 528-499.000.
Mori, Hazime; Kohyama, Katsuhisa; and Nakamura, Katsuhiko, to Mitsubishi Chemical Industries, Ltd. Process for producing a halogen-containing polycarbonate resin. 4,323,663, Cl. 525-470.000.
Mori, Toshihiro, to Nippon Electric Co., Ltd. Radio pager with reduced power consumption. 4,323,881, Cl. 340-825.480.
Morikama, Osamu: *See—*
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.
Morishita Pharmaceutical Co., Ltd.: *See—*
Seki, Kunio; and Ohki, Masahiko, 4,323,576, Cl. 424-273.00P.
Morishita, Teru; Sugiyama, Matsuyoshi; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,323,197, Cl. 239-703.000.
Morita, Masayuki; Nakano, Tasuku; and Kubota, Kazuhisa, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Turn direction detector for use in automobile. 4,323,877, Cl. 340-56.000.
Moritz, Bertil; and Tonnesen, Ole, to ASEA Aktiebolag. Transformer or reactor having a winding formed from sheet material. 4,323,870, Cl. 336-206.000.
Morris, Robert B.; and Clemmons, Quentin T., to American Standard Inc. Hydro-pneumatic brake actuator arranged to maintain a constant brake shoe clearance. 4,323,144, Cl. 188-196.00A.
Morrison, Howard J.: *See—*
Hanson, Steven P.; Morrison, Howard J.; and Montague, Douglas P., 4,323,243, Cl. 273-153.00S.
Morrison-Knudsen Forest Products Company, Inc.: *See—*
Peters, Thomas E.; and Bateman, John M., 4,323,338, Cl. 425-174.80E.
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., to Burroughs Wellcome Co. Pyrimido(4,5-c)pyridazines. 4,323,679, Cl. 544-256.000.
Mortensen, Harold R., to Facet Enterprises, Inc. Engine starter with an overrunning clutch device. 4,322,985, Cl. 74-6.000.
Moss, Michael Y.: *See—*
Rosso, Paul D.; and Moss, Michael Y., 4,323,557, Cl. 424-28.000.
Motoda, Calvin: *See—*
Miyagishima, Tosh; and Motoda, Calvin, 4,323,256, Cl. 277-126.000.
Motoren-und Turbinen-Union Munchen GmbH: *See—*
Hoffmuller, Wilhelm; Rossmann, Axel; and Schreiber, Franz, 4,323,394, Cl. 75-208.00R.
Motorola, Inc.: *See—*
Lathrope, Michael F., 4,323,796, Cl. 307-353.000.
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake system of a multi-cylinder internal combustion engine. 4,323,038, Cl. 123-188.00M.
Motz, Lloyd: *See—*
Secunda, David J.; and Motz, Lloyd, 4,323,424, Cl. 159-48.00R.
Mucenieks, Paul R., to FMC Corporation. Treatment of brine. 4,323,437, Cl. 204-98.000.
Muck, Karl-Friedrich; Sextro, Gunter; and Burg, Karlheinz, to Hoechst Aktiengesellschaft. Process for the simultaneous preparation of trioxan and cyclic formals. 4,323,502, Cl. 260-340.000.
Muderlak, Kenneth J., to KCS Industries, Inc. Indicia display device. 4,322,904, Cl. 40-495.000.
Mudrov, Oleg A.: *See—*
Veselovsky, Roman A.; Kuxin, Anatoly N.; Mudrov, Oleg A.; and Roitenberg, Yakov I., 4,323,491, Cl. 524-144.000.
Muhlberger, Emil: *See—*
Schmidt, Peter; and Muhlberger, Emil, 4,322,876, Cl. 29-25.190.
Muhr, Richard; and Schulte, Karl-Heinz, to Muhr und Bender. Shear having U-shaped clips connecting drive and work plates. 4,322,994, Cl. 83-616.000.
Muhr und Bender: *See—*
Muhr, Richard; and Schulte, Karl-Heinz, 4,322,994, Cl. 83-616.000.
Mukoyama, Yoshiyuki; and Chikazumi, Nobutoshi, to Hitachi Chemical Company, Ltd. Process for producing granular polymer having uniform fine particle size. 4,323,664, Cl. 526-88.000.
Muller, Karl-Heinz; and Forg, Wolfgang, to Linde Aktiengesellschaft. Rectification of gaseous mixtures. 4,323,380, Cl. 62-28.000.
Muller, Stefan; Thun, Gerhard; and Glauner, Wolfgang, to Kernforschungszentrum Karlsruhe GmbH. Flowmeter. 4,322,982, Cl. 73-861.220.
Muller, Thomas, to Robert Bosch GmbH. Strain relief device for an electrical supply line. 4,323,725, Cl. 174-65.00R.
Muller, Walter: *See—*
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,323,670, Cl. 542-415.000.
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,323,671, Cl. 542-415.000.
Murakami, Shinichi: *See—*
Uno, Koichi; and Murakami, Shinichi, 4,323,405, Cl. 156-64.000.
Muraki, Toshio: *See—*
Chiba, Kazumasa; Egawa, Keiichi; and Muraki, Toshio, 4,323,639, Cl. 430-281.000.
Muramoto, Ei-ichi; and Matsui, Motomu, to Kabushiki Kaisha Komatsu Seisakusho. Track adjusting and recoil apparatus for use with crawler vehicles. 4,323,283, Cl. 305-10.000.
Murata Manufacturing Co., Ltd.: *See—*
Inoue, Jiro, 4,323,866, Cl. 333-188.000.
Mandai, Harufumi; and Nishimura, Kunitaro, 4,323,617, Cl. 428-148.000.
Tanaka, Yasuhiro; and Kakehi, Sasuga, 4,323,865, Cl. 333-187.000.
Murch, Charles K.; and Hunter, Charles R., to TRW Inc. Thermal thruster with superheater. 4,322,946, Cl. 60-203.100.
Murrmann, Helmuth; Rathbone, Ronald; and Schwabe, Ulrich, to Siemens Aktiengesellschaft. Integrated semiconductor circuit arrangement. 4,323,913, Cl. 357-51.000.
Myers, Robert F., to Pfizer Inc. 6-(2-Aryl-2-(1,1-dioxopenicillanoyloxymethoxycarbonyl)acetamido penicillanic acids. 4,323,499, Cl. 260-239.100.
Nacci, George R., to Du Pont de Nemours, E. I., and Company. Printing process using lithographic plates made from toned amplitude modulated magnetic images. 4,323,929, Cl. 358-301.000.
Nagahara, Shusaku: *See—*
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.
Nagahori, Teiji; and Ohshima, Masanori. Hot dipping lead base coating material. 4,323,393, Cl. 75-166.00C.

Nagai, Shigeki: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Connecting mechanism for two members of a bicycle derailleur. 4,323,357, Cl. 474-82.000.
Nagasawa, Toshio: *See*—
Nishimura, Hiroshi; Monma, Tetsuo; Yoshida, Minoru; Kirimoto, Kazunari; Hayamizu, Yoshio; and Nagasawa, Toshio, 4,323,607, Cl. 219-213.000.
Nagase, Junji: *See*—
Saito, Retsuo; and Nagase, Junji, 4,323,048, Cl. 124-78.000.
Nagata, Wataru: *See*—
Narisada, Masayuki; and Nagata, Wataru, 4,323,567, Cl. 424-248.510.
Nagoshi, Eiichi: *See*—
Okada, Mitsuo; Nagoshi, Eiichi; and Matsumoto, Yoshihisa, 4,323,326, Cl. 411-412.000.
Naito, Keiichi: *See*—
Watanabe, Masanao; Naito, Keiichi; Odajima, Tooru; and Fujiwara, Yoshio, 4,323,659, Cl. 525-108.000.
Nakabo, Satoru: *See*—
Ishihara, Hideo; Suzuki, Shizuo; and Nakabo, Satoru, 4,323,984, Cl. 365-10.000.
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, to Sankyo Company Limited; and Ube Industries, Ltd. 4-Aminoquinazoline compounds useful as agricultural fungicides. 4,323,680, Cl. 544-293.000.
Nakagawa, Junichi: *See*—
Ohtani, Yoshitaka; and Nakagawa, Junichi, 4,323,432, Cl. 203-85.000.
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigerating apparatus. 4,322,952, Cl. 62-198.000.
Nakajima, Maki: *See*—
Yamazaki, Kazuhide; Ogawa, Shigetoshi; Suma, Atsushi; and Nakajima, Maki, 4,323,014, Cl. 104-13.000.
Nakamura, Katsuhiko: *See*—
Mori, Hazime; Kohyama, Katsuhisa; Nakamura, Katsuhiko; and Takamatsu, Shinichi, 4,323,519, Cl. 528-499.000.
Mori, Hazime; Kohyama, Katsuhisa; and Nakamura, Katsuhiko, 4,323,663, Cl. 525-470.000.
Nakamura, Kimio; Fujisawa, Kimio; and Ochiai, Kokichi, to Nissan Motor Company, Limited. Power supply circuit for automotive vehicles. 4,323,837, Cl. 322-7.000.
Nakamura, Masaaki: *See*—
Ohkuma, Takaaki; Ninomiya, Hiroshi; Nakamura, Masaaki; and Idzu, Genichi, 4,323,577, Cl. 424-298.000.
Nakamura, Norimitsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Central processing unit with improved ALU circuit control. 4,323,981, Cl. 364-749.000.
Nakamura, Shigeo: *See*—
Nichimoto, Susumu; Shinoda, Isao; Nakamura, Shigeo; and Tsumura, Haruhide, 4,323,148, Cl. 194-100.00A.
Nakamura, Taku; Ogawa, Masasi; and Ishigaki, Kunio, to Fuji Photo Film Co., Ltd. Photographic material containing polymers with active ester groups. 4,323,644, Cl. 430-518.000.
Nakanishi, Teruyuki; and Hitomi, Kiyoshi, to Kawasaki Steel Corporation. Method of producing H-beams. 4,322,962, Cl. 72-234.000.
Nakano, Tasuku: *See*—
Morita, Masayuki; Nakano, Tasuku; and Kubota, Kazuhisa, 4,323,877, Cl. 340-56.000.
Nakao, Makoto: *See*—
Itoi, Eiji; Nakayama, Takashi; Nakao, Makoto; and Matsumura, Yukio, 4,323,436, Cl. 204-98.000.
Nakaoka, Kazuhide; Araki, Kenzi; Iwase, Kozi; Kubotera, Haruo; Kurihara, Takao; and Tanaka, Nobuo, to Nippon Kokan Kabushiki Kaisha. Continuous annealing method for cold reduced steel strip. 4,323,403, Cl. 148-134.000.
Nakaoka, Manabu: *See*—
Saita, Shigeaki; and Nakaoka, Manabu, 4,323,225, Cl. 269-43.000.
Nakayama, Takashi: *See*—
Itoi, Eiji; Nakayama, Takashi; Nakao, Makoto; and Matsumura, Yukio, 4,323,436, Cl. 204-98.000.
Nambu, Hirohiko: *See*—
Hashimoto, Isao; and Nambu, Hirohiko, 4,323,505, Cl. 260-345.200.
Nancarrow, James H.: *See*—
Byrne, Joe L.; Kobayashi, Robert J.; and Nancarrow, James H., 4,322,949, Cl. 60-606.000.
Narisada, Masayuki; and Nagata, Wataru. Arylmalonamido-1-oxadethiacephalosporins. 4,323,567, Cl. 424-248.510.
Narumi China Corporation: *See*—
Uno, Koichi; and Murakami, Shinichi, 4,323,405, Cl. 156-64.000.
Nash Engineering Company, The: *See*—
Haavik, Harold K., 4,323,334, Cl. 417-68.000.
National Can Corporation: *See*—
Basa, Kenneth B.; and Agusto, Robert G., 4,323,583, Cl. 426-250.000.
Basa, Kenneth B.; and Agusto, Robert G., 4,323,587, Cl. 426-540.000.
National Research Development Corporation: *See*—
McAuliffe, Charles A.; Levason, William; and McCullough, Francis P., 4,323,543, Cl. 423-219.000.
National Research Institute for Metals: *See*—
Tachikawa, Kyoji; and Sekine, Hisashi, 4,323,402, Cl. 148-133.000.
National Semiconductor Corporation: *See*—
Buurma, Gerald B., 4,323,887, Cl. 340-347.0AD.
National Service Industries, Inc.: *See*—
Hutchison, Mark A., 4,323,953, Cl. 362-226.000.
NCR Corporation: *See*—
Duley, Raymond S., 4,323,886, Cl. 340-347.0AD.
Italiano, Victor J., 4,323,907, Cl. 346-140.00R.
Reitberger, Peter H.; and Weber, Helmut, 4,323,905, Cl. 346-75.000.
Neckamm, Harald: *See*—
Beitler, Franz; and Neckamm, Harald, 4,323,936, Cl. 360-85.000.
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, to Bayer Aktiengesellschaft. Anthraquinone-azomethine compounds, processes for their preparation and processes for pigmenting organic macromolecular substances. 4,323,670, Cl. 542-415.000.
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, to Bayer Aktiengesellschaft. Anthraquinone derivatives, processes for their preparation, processes for pigmenting organic macromolecular substances, and pigmented organic macromolecular material. 4,323,671, Cl. 542-415.000.
Negi, Virendra S.: *See*—
Peters, Arthur; Negi, Virendra S.; Cushing, David E.; Brown, Richard P.; and Joyce, Thomas F., 4,323,967, Cl. 364-200.000.
Negishi, Akio, to Akebono Brake Industry Co., Ltd. Automatic gap adjusting device for disc brake incorporating mechanical brake mechanism. 4,323,143, Cl. 188-71.900.
Nehrbas, George M., Jr. Golf practice putting aid. 4,323,246, Cl. 273-186.00A.
Nelms, George E., to Medtronic, Inc. Pacemaker programming apparatus utilizing a computer system with simplified data input. 4,323,074, Cl. 128-419.0PG.
Nelson, Eric L., to Nelson Research & Development Co. Topical trien containing pharmaceutical compositions and methods of use. 4,323,558, Cl. 424-164.000.
Nelson Research & Development Co.: *See*—
Nelson, Eric L., 4,323,558, Cl. 424-164.000.
Nelson, Robert G.: *See*—
Goode, James W.; Penner, Wayne A.; Ray, Charles D.; and Nelson, Robert G., 4,323,990, Cl. 367-21.000.
Nemoto, Kazuyuki: *See*—
Terada, Katumi; and Nemoto, Kazuyuki, 4,323,828, Cl. 318-45.000.
Neufeld, Henry L., to Brunswick Corporation. Selective anti-reverse mechanism. 4,323,203, Cl. 242-84.20A.
Neumann, Robert G., to Specialty Papers Company, The. Packaging method using an adhesive coated web. 4,322,929, Cl. 53-451.000.
Nevstruev, Vladimir I.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.
New York University: *See*—
Abele, Manlio; Passalaqua, Anthony M.; and Chase, Norman E., 4,322,974, Cl. 73-602.000.
Newbold, Don; and Sherwin, Owen W., to Valmont Industries, Inc. Spinner water drive system and control. 4,323,194, Cl. 239-177.000.
Newman, Ira J. Television projector apparatus. 4,323,926, Cl. 358-237.000.
NGK Spark Plug Co., Ltd.: *See*—
Takami, Akio; Matsuura, Toshitaka; and Saito, Tsutomu, 4,322,968, Cl. 73-27.00R.
Nibby, Chester M., Jr.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Moore, Dana, 4,323,965, Cl. 364-200.000.
Nichimoto, Susumu; Shinoda, Isao; Nakamura, Shigeo; and Tsumura, Haruhide, to Matsushita Electric Industrial Co., Ltd. Coin selector for vending machine. 4,323,148, Cl. 194-100.00A.
Nielsen, Leif: *See*—
Huelle, Zbigniew R.; and Nielsen, Leif, 4.323,220, Cl. 251-11.000.
Nielsen, Ole S. M. Piston for ejecting a viscous or plastic mass. 4,323,177, Cl. 222-386.000.
Niepmann, Otto, to Maschinenfabrik Fr. Niepmann & Co. Method of manufacturing packs of cigarettes and pack produced by such method. 4,322,931, Cl. 53-449.000.
Nierenberg, Morton J., to RCA Corporation. Method of making a machine-readable marking in a workpiece. 4,323,755, Cl. 219-121.0LJ.
Nikolaus Sorg GmbH & Co. KG: *See*—
Sims, George R., 4,323,383, Cl. 65-135.000.
Ninomiya, Hiroshi: *See*—
Ohkuma, Takaaki; Ninomiya, Hiroshi; Nakamura, Masaaki; and Idzu, Genichi, 4,323,577, Cl. 424-298.000.
Ninomiya, Kunihiro: *See*—
Kikumoto, Kyoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, 4,323,568, Cl. 424-250.000.
Nippe, Burkhard: *See*—
Kober, Heinrich; Nippe, Burkhard; and Seidel, Bernhard, 4,323,621, Cl. 428-216.000.
Nippon Electric Co., Ltd.: *See*—
Kurokawa, Teruhisa, 4,323,853, Cl. 330-43.000.
Mori, Toshihiro, 4,323,881, Cl. 340-825.480.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Masayasu; Nishikawa, Hideo; and Yoshida, Kayoko, 4,323,565, Cl. 424-246.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Ohkuma, Takaaki; Ninomiya, Hiroshi; Nakamura, Masaaki; and Idzu, Genichi, 4,323,577, Cl. 424-298.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Fukuda, Shuzo; and Ohkubo, Yutaka, 4,323,604, Cl. 427-433.000.
Nakaoka, Kazuhide; Araki, Kenzi; Iwase, Kozi; Kubotera, Haruo; Kurihara, Takao; and Tanaka, Nobuo, 4,323,403, Cl. 148-134.000.
Nippon Kokuyu Tetsudo: *See*—
Yamazaki, Kazuhide; Ogawa, Shigetoshi; Suma, Atsushi; and Nakajima, Maki, 4,323,014, Cl. 104-13.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Suzuki, Toshio, 4,323,289, Cl. 308-202.000.
Nippon Soken, Inc.: *See*—
Tsuge, Noboru; Kuwakado, Satosi; and Shimogawa, Toshiaki, 4,323,205, Cl. 242-107.40A.
Nippon Telegraph and Telephone Public Corp.: *See*—
Ogawa, Kazuo; Suzuki, Eiji; Kurita, Osamu; and Horikawa, Izumi, 4,323,864, Cl. 333-165.000.
Nippon Zeon Co., Ltd.: *See*—
Joh, Yasushi, 4,323,627, Cl. 428-398.000.
Nishihara, Motohisa: *See*—
Suzuki, Seikou; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Hachino, Hiroaki; and Takahashi, Minoru, 4,322,980, Cl. 73-727.000.
Nishikawa, Hideo: *See*—
Hasegawa, Masayasu; Nishikawa, Hideo; and Yoshida, Kayoko, 4,323,565, Cl. 424-246.000.
Nishimura, Hiroshi; Monma, Tetsuo; Yoshida, Minoru; Kirimoto, Kazunari; Hayamizu, Yoshio; and Nagasawa, Toshio, to UBE Industries, Ltd.; and Furukawa Electric Co., Ltd., The. Heat shrinkable covers. 4,323,607, Cl. 219-213.000.
Nishimura, Kenji: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.
Nishimura, Kunitaro: *See*—
Mandai, Harufumi; and Nishimura, Kunitaro, 4,323,617, Cl. 428-148.000.
Nishina, Haruo: *See*—
Honda, Tsuneo; Nishina, Haruo; and Uehara, Shuichi, 4,323,391, Cl. 75-14.000.
Nissan Motor Company, Limited: *See*—
Hira, Kazumi; and Tasho, Masao, 4,323,276, Cl. 296-214.000.
Iijima, Tetsuya, 4,323,111, Cl. 165-25.000.
Mochida, Haruo, 4,322,959, Cl. 70-241.000.
Nakamura, Kimio; Fujisawa, Kimio; and Ochiai, Kokichi, 4,323,837, Cl. 322-7.000.
Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, 4,323,598, Cl. 427-160.000.
Nitta Belting Co., Ltd.: *See*—
Shinagawa, Takehisa; and Inoue, Tsunehiko, 4,323,374, Cl. 55-132.000.
Noad, Julian P.; Springthorpe, Anthony J.; and Look, Christopher M., to Northern Telecom Limited. Chanelled substrate double heterostructure lasers. 4,323,859, Cl. 372-46.000.
Noll, Hans, to Maschinen- und Armaturen- J & W Muller, fabrik GmbH. Apparatus for forming a closed cut surface in a wall of a workpiece. 4,323,223, Cl. 266-54.000.
Nolte, Robert K.; Rath, Robert E.; and Jarvis, Michael F., to Metalwash Machinery Corp. Pan wash energy. 4,323,091, Cl. 134-60.000.
Nordeen, Howard C., to Mark Controls Corporation. No energy band temperature control. 4,323,112, Cl. 165-27.000.
Norlin Industries, Inc.: *See*—
Wangard, William; and Starkey, David, 4,322,996, Cl. 84-1.240.
Norsk Hydro a.s.: *See*—
Heggebo, Trygve; and Conradsen, Arne, 4,323,386, Cl. 71-35.000.
North American Philips Controls Corp.: *See*—
Harper, George S., 4,323,868, Cl. 335-38.000.
North, Bernard: *See*—
Lumby, Roland J.; North, Bernard; Taylor, Alfred J.; and Thomas, Roland M., 4,323,323, Cl. 407-119.000.
North Carolina State University: *See*—
Haddock, William H., 4,323,019, Cl. 111-2.000.
Northern Telecom Limited: *See*—
Brown, Anthony K. D., 4,323,730, Cl. 179-1.00P.
Noad, Julian P.; Springthorpe, Anthony J.; and Look, Christopher M., 4,323,859, Cl. 372-46.000.
Northrop Corporation: *See*—
Schmidt, Robert A.; and Stevens, Ewell E., 4,322,975, Cl. 73-633.000.
Norval, Stephen V., to Imperial Chemical Industries Limited. Oxidation of substituted aromatic compounds to aromatic carboxylic acids. 4,323,699, Cl. 562-416.000.
Nounen, Michiyasu; and Iwasaki, Yukio, to Mitsubishi Denki Kabushiki Kaisha. Fuse. 4,323,873, Cl. 337-186.000.
Nowell, John R., to Honeywell Information Systems Inc. Circuit for controlling the switching frequency of SCR regulators. 4,323,958, Cl. 363-28.000.
Nowicki, Andrzej N.; and Smith, David H., to Samuel Pegg & Son, Limited. Apparatus for drying of tubular fabrics. 4,322,957, Cl. 68-13.00R.
Nowotny, Alois H., to Temple University of the Commonwealth System of Higher Education. Process of enhancing immmunogenic response in mammals by the administration of synthetic glycolipid adjuvants. 4,323,561, Cl. 424-180.000.
Noxso Corporation: *See*—
Magder, Jules, 4,323,544, Cl. 423-239.000.
Nuc Med Inc.: *See*—
Crockford, David R.; and Rhodes, Buck A., 4,323,546, Cl. 424-1.000.
Numata, M.: *See*—
McIntosh, James K.; and Numata, M., 4,323,047, Cl. 124-1.000.
Nyagu, Ivan F.: *See*—
Sereda, Alexandr I.; Nyagu, Ivan F.; Smirnov, Igor N.; Russu, Grigory I.; and Yasinovsky, Izrail L., 4,323,004, Cl. 99-275.000.
Oak Industries Inc.: *See*—
den Toonder, Pieter; Doles, Glenn P.; Lund, John A.; Merrell, Richard G.; and Stubbs, Graham S., 4,323,922, Cl. 358-117.000.
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, to Mitsui Toatsu Chemicals, Inc. Thermosetting resin compositions comprising bismaleimides and alkenylaniline derivatives. 4,323,662, Cl. 525-281.000.
Obayashi, Hidehito: *See*—
Matsuyama, Iwao; Susa, Kenzo; Suganuma, Tsuneo; Satoh, Shin; Katsuyama, Toshio; and Obayashi, Hidehito, 4,323,381, Cl. 65-32.000.
Oberg, Robert E.; Stewart, Clarence E.; and Geelan, Thomas C., to Broyhill Company, The. Impregnator system. 4,323,313, Cl. 366-142.000.
Occidental Research Corporation: *See*—
Crosby, Alan C.; and Campen, David C., 4,323,365, Cl. 23-313.00R.
Ochiai, Kokichi: *See*—
Nakamura, Kimio; Fujisawa, Kimio; and Ochiai, Kokichi, 4,323,837, Cl. 322-7.000.
O'Connell, Robert M., to United States of America, Air Force. Surface acoustic wave substrate having orthogonal temperature compensated propagation directions and device applications. 4,323,809, Cl. 310-313.00A.
O'Connor, James G.: *See*—
Sommers, Edward G., Jr.; and O'Connor, James G., 4,323,342, Cl. 431-66.000.
Oda, Kiroku: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.
Odagiri, Masaru: *See*—
Kunieda, Toshiaki; Odagiri, Masaru; Fujita, Takashi; and Shinohara, Koichi, 4,323,629, Cl. 428-457.000.
Odajima, Tooru: *See*—
Watanabe, Masanao; Naito, Keiichi; Odajima, Tooru; and Fujiwara, Yoshio, 4,323,659, Cl. 525-108.000.
Odenwalder Kunststoffwerke GmbH: *See*—
Liebrich, Wolfgang; and Schneider, Dieter, 4,323,320, Cl. 404-10.000.
O'Donnell, Patrick J.: *See*—
Bridges, Clive A.; and O'Donnell, Patrick J., 4,323,776, Cl. 250-332.000.
O'Farrell, Patrick H., to University of California, The Regents of the. Method and apparatus for dynamic equilibrium electrophoresis. 4,323,439, Cl. 204-180.00G.
Office National d'Etudes et de Recherches: *See*—
Bloch, Bertrand; Mercier, Chantal C.; and Charrier, Denis, 4,323,695, Cl. 560-145.000.
Ogawa, Kazuo; Suzuki, Eiji; Kurita, Osamu; and Horikawa, Izumi, to Fujitsu Limited; and Nippon Telegraph and Telephone Public Corp. Binary transversal filter. 4,323,864, Cl. 333-165.000.
Ogawa, Koichi: *See*—
Tanaka, Yoshinobu; Ogawa, Koichi; and Hioka, Minoru, 4,323,455, Cl. 210-321.200.
Ogawa, Masasi: *See*—
Nakamura, Taku; Ogawa, Masasi; and Ishigaki, Kunio, 4,323,644, Cl. 430-518.000.
Ogawa, Shigetoshi: *See*—
Yamazaki, Kazuhide; Ogawa, Shigetoshi; Suma, Atsushi; and Nakajima, Maki, 4,323,014, Cl. 104-13.000.
Ohashi, Hiroyuki: *See*—
Takami, Toru; Takezawa, Misako; Ohashi, Hiroyuki; and Takeda, Shigeru, 4,323,563, Cl. 424-199.000.
Ohki, Masahiko: *See*—
Seki, Kunio; and Ohki, Masahiko, 4,323,576, Cl. 424-273.00P.
Ohkubo, Yutaka: *See*—
Fukuda, Shuzo; and Ohkubo, Yutaka, 4,323,604, Cl. 427-433.000.
Ohkuma, Takaaki; Ninomiya, Hiroshi; Nakamura, Masaaki; and Idzu, Genichi, to Nippon Kayaku Kabushiki Kaisha. Aqueous solution of nitroglycerin. 4,323,577, Cl. 424-298.000.
Ohnishi, Masahiro; and Kimura, Tsutomu, to Fuji Photo Film Co., Ltd. Device for correcting pitch of scanning lines in a light beam recording system. 4,323,906, Cl. 346-76.00L.
Ohshima, Masanori: *See*—
Nagahori, Teiji; and Ohshima, Masanori, 4,323,393, Cl. 75-166.00C.
Ohtani, Masami: *See*—
Chiyoda, Tsuneyuki; and Ohtani, Masami, 4,323,191, Cl. 236-44.00A.
Ohtani, Yoshitaka; and Nakagawa, Junichi, to Mitsui Petrochemical Industries, Ltd. Process for isolating and recovering meta- and para-cresols from crude cresol-containing compositions composed of cresol components, unreacted cymene components and high-boiling by-products. 4,323,432, Cl. 203-85.000.

Oi, Tetsu: *See—*
Kobayashi, Toshio; and Oi, Tetsu, 4,323,418, Cl. 156-617.0SP.

Oil Control S.r.l.: *See—*
Acerbi, Leo, 4,323,095, Cl. 137-87.000.

Oishi, Yasushi, to Fuji Photo Film Co., Ltd. Direct reversal photographic color material. 4,323,635, Cl. 430-217.000.

Oka, Yoshitake; Ishihara, Tetsuo; Suzuki, Masane; and Kanaya, Motonori, to Daicel Chemical Industries, Ltd. Method for cutting specific layer of synthetic resin laminated film. 4,323,757, Cl. 219-121.0LN.

Okada, Mitsuo; Nagoshi, Eiichi; and Matsumoto, Yoshihisa. Self-drilling screw. 4,323,326, Cl. 411-412.000.

Okajima, Mutsuo; and Hisada, Hideo, to Shinto Paint Co., Ltd. Rotary-type melt applicator. 4,323,195, Cl. 239-215.000.

Okamura, Eiji, to Fujitsu Limited. System for controlling the speed of a magnetic tape transport motor. 4,323,832, Cl. 318-341.000.

Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, to Nissan Motor Co., Ltd. Method of coating glass surface with heat-reflecting metal oxide film. 4,323,598, Cl. 427-160.000.

Okushima, Hiromi; Fujimori, Shinichiro; Furuya, Rikizo; and Hayakawa, Shuzo, to Mitsubishi Chemical Industries, Limited. Method for preparing 7α-acylthio-4-en-3-oxosteroids. 4,323,500, Cl. 260-239.570.

Okuyama, Kiyotaka; and Hosaka, Akihiko, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,323,628, Cl. 428-425.900.

Old King Coal, Ltd.: *See—*
Auerbach, Les M.; and Ricker, William F., 4,323,051, Cl. 126-77.000.

Olear, John, to Dorr-Oliver Incorporated. Corner sweep mechanism for square settling tank. 4,323,456, Cl. 210-529.000.

Olin Corporation: *See—*
Rowe, John P., 4,322,907, Cl. 42-88.000.

Olson, Daniel R., to General Electric Company. Process for producing an ultraviolet radiation stabilized polymeric article. 4,323,597, Cl. 427-160.000.

Olson, John B.: *See—*
Hickman, John S.; Olson, John B.; and Jeanson, Richard L., 4,323,290, Cl. 312-100.000.

Olympus Optical Co., Ltd.: *See—*
Ishii, Fumiaki, 4,323,304, Cl. 354-62.000.
Kimura, Tadashi, 4,323,302, Cl. 350-426.000.
Terada, Katumi; and Nemoto, Kazuyuki, 4,323,828, Cl. 318-45.000.

O'Neal, Larry. Mounting for inflatable dock seal. 4,322,923, Cl. 52-2.000.

Ono, Naotoshi: *See—*
Miyazawa, Takeshi; and Ono, Naotoshi, 4,322,896, Cl. 37-43.00E.

Oonishi, Toshiyuki: *See—*
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,322,952, Cl. 62-198.000.

Opitz, Wolfgang; Etscherberg, Eugen; Dell, Hans-Dieter; and Jacobi, Haireddin, to Troponwerke GmbH & Co. KG. Methoxy and methylsulfinylthiolesters. 4,323,517, Cl. 260-455.00R.

Oppenlaender, Knut: *See—*
Vogel, Hans-Henning; Strickler, Rainer; Oppenlaender, Knut; and Baur, Richard, 4,323,689, Cl. 548-336.000.

Ordibel Sprl: *See—*
Meus, Roger R., 4,323,229, Cl. 270-58.000.

Orgeret, Lucien, to Societe Anonyme dite: Delle-Alsthom. Set of bars for a high-tension unit. 4,323,720, Cl. 174-21.0JS.

Orii, Akira: *See—*
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, 4,323,833, Cl. 318-376.000.

Orlyansky, Vitaly V.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Oros Corporation: *See—*
Merrick, Llewellyn S., 4,323,738, Cl. 179-175.10R.

O'Rourke, J. Cam; Pilkington, G. Roger; and Bercha, Frank G., to Dome Petroleum Limited. Warm air canopy system for providing ice-free zone. 4,323,322, Cl. 405-217.000.

Osada, Hiroshi, to Kai Cutlery Center Co., Ltd. Knife apparatus. 4,322,885, Cl. 30-162.000.

Osadchenko, Alexandr I.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Otis Elevator Company: *See—*
Bittar, Joseph, 4,323,142, Cl. 187-29.00R.

Otis Engineering Corporation: *See—*
Remillard, Gerard J.; Cruz, Frank, Sr.; Devoss, Daniel W., Jr.; and Miller, Truman A., 4,322,992, Cl. 82-34.00R.

Ott, Henry W.; and Tilson, Bernard A., to Bell Telephone Laboratories, Inc. Range extender with variable gain for coin telephone loops. 4,323,733, Cl. 179-6.30R.

Ours, Carroll W.; and Lee, Cheuk M., to Abbott Laboratories. Hydroxyaminomethyl derivatives of benzoyl di-substituted α-phenoxyalkanoyl esters. 4,323,691, Cl. 560-36.000.

Outboard Marine Corporation: *See—*
Blanchard, Clarence E., 4,323,354, Cl. 440-75.000.
Efflandt, James F., 4,322,938, Cl. 56-320.200.
Poehlman, Arthur G., 4,322,935, Cl. 56-11.300.
Stephenson, Donald K., 4,323,356, Cl. 440-86.000.

Outokumpu Oy: *See—*
Saarinen, Heimo U. A.; and Seilo, Matti, 4,323,541, Cl. 423-37.000.

Overman, Joseph D.: *See—*
Hall, Laurence W.; and Overman, Joseph D., 4,323,645, Cl. 430-564.000.

Owens-Illinois, Inc.: *See—*
Uhlig, Albert R., 4,323,340, Cl. 425-325.000.
Uhlig, Albert R., 4,323,411, Cl. 156-245.000.

Oxford Air Systems, Inc.: *See—*
Fritz, Frederick F., 4,323,373, Cl. 55-96.000.

Oy Wartsila Ab: *See—*
Ritvanen, Tapio, 4,323,371, Cl. 55-19.000.

Ozdi Kohaszati Uzemek: *See—*
Furjes, Emil; and Kecskes, Istvan, 4,323,108, Cl. 164-488.000.

P C U K Produits Chimiques Ugine Kuhlmann: *See—*
Cognion, Jean-Marie; and Kervennal, Jacques, 4,323,515, Cl. 260-453.00P.

P. Campen Maskinfabrik A/S: *See—*
Hansen, Niels H. V.; Mikkelsen, Erling H.; and Vissing, Soren, 4,323,474, Cl. 252-307.000.

Pagani, Mario: *See—*
Bocca, Alberto; and Pagani, Mario, 4,322,864, Cl. 12-24.500.

Paielli, Michael F. Trailer load supporting assembly. 4,323,264, Cl. 280-405.00A.

Palmer, Keith W.: *See—*
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,323,475, Cl. 252-373.000.

Panduit Corp.: *See—*
Turek, James A., 4,323,227, Cl. 269-254.00R.

Panzarino, Joseph N.: *See—*
Borrelli, Nicholas F.; Luderer, Albert A.; and Panzarino, Joseph N., 4,323,056, Cl. 128-1.300.

Parbuzina, Iraida L.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Gakh, Igor G.; Parbuzina, Iraida L.; Savitsky, Evgeny M.; Polyakova, Viktoria P.; and Roshan, Natalia R., 4,323,708, Cl. 564-418.000.

Parisius, Wolf J.: *See—*
Sun, Anthony M.; and Parisius, Wolf J., 4,323,457, Cl. 210-645.000.

Parker, Thomas G., to Roberts Consolidated Industries, Inc. Water repellent and preservative for wood products. 4,323,602, Cl. 427-298.000.

Parrack, Alvin L.; and Lunsford, Delbert R., to Texaco Inc. Method for reducing multiple events in a seismic record. 4,323,876, Cl. 367-40.000.

Parran, John J., Jr., to Procter & Gamble Company, The. Mouthwash compositions. 4,323,551, Cl. 424-54.000.

Pasco, Ian K., to Combined Optical Industries Ltd. Laminar light guide. 4,323,951, Cl. 362-27.000.

Passalaqua, Anthony M.: *See—*
Abele, Manlio; Passalaqua, Anthony M.; and Chase, Norman E., 4,322,974, Cl. 73-602.000.

Patel, Raman: *See—*
Coran, Aubert Y.; and Patel, Raman, 4,323,625, Cl. 428-361.000.

Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galyan, Boris A. Pipe resistance butt welding apparatus. 4,323,752, Cl. 219-101.000.

Paulis, George J.; and DeCarlo, Joseph D., to United Technologies Corporation. Crashworthy aircraft fuel storage system. 4,323,094, Cl. 137-68.00R.

Pav-Saver Mfg. Co.: *See—*
Dale, Charles H., 4,323,321, Cl. 404-105.000.

Pavljuchenko, Valery N.: *See—*
Shirinian, Vram T.; Mnatsakanov, Suren S.; Pavljuchenko, Valery N.; Rozenberg, Mark E.; Gromov, Valery V.; and Ivanchev, Sergei S., 4,323,666, Cl. 526-329.000.

Pavone, Robert J., to Gulf & Western Corporation. Transfer apparatus for natural tobacco leaves. 4,323,149, Cl. 198-471.000.

Paz, Alberto B.: *See—*
Cezar, Robert M.; and Paz, Alberto B., 4,323,915, Cl. 358-4.000.

Pecheux, Jean-Claude R. Splint. 4,323,060, Cl. 128-84.00R.

Peek, Henry L., to Siemens-Allis, Inc. Means for operating blast valve in two-pressure circuit breaker. 4,323,743, Cl. 200-148.00F.

Pellenc, Roger, to Etablissements Pellenc & Motte. Coaxial coupling system. 4,323,269, Cl. 285-133.00R.

Pelletier, Robert A. Method and apparatus for beneficiating coal. 4,323,449, Cl. 209-17.000.

Penner, Wayne A.: *See—*
Goode, James W.; Penner, Wayne A.; Ray, Charles D.; and Nelson, Robert G., 4,323,990, Cl. 367-21.000.

Peraldo, Mario: *See—*
Silvestrini, Vittorio; Peraldo, Mario; and Monza, Enrico, 4,323,619, Cl. 428-212.000.

Pere, Gerard, to Creusot-Loire. Electrolyzer having a horizontal tubular enclosure. 4,323,443, Cl. 204-253.000.

Pere, Gerard: *See—*
Lantin, Patrice; and Pere, Gerard, 4,323,442, Cl. 204-237.000.

Perkin-Elmer Corporation, The: *See—*
Rising, Robert P., 4,323,230, Cl. 271-12.000.

Peter, Cornelius, to Robert Bosch GmbH. Method and apparatus for controlling start-up of airflow measuring systems in automotive vehicles. 4,322,970, Cl. 73-118.000.

Peters, Arthur; Negi, Virendra S.; Cushing, David E.; Brown, Richard P.; and Joyce, Thomas F., to Honeywell Information Systems Inc. Local bus interface for controlling information transfers between units in a central subsystem. 4,323,967, Cl. 364-200.000.

Peters, Thomas E.; and Bateman, John M., to Morrison-Knudsen Forest Products Company, Inc. Apparatus for orientation and deposition of discrete lignocellulosic materials. 4,323,338, Cl. 425-174.80E.

Peterson, Steven C.; Stevens, Leonard W.; and Tanrikut, Ibrahim S., to United Technologies Corporation. Fuel nozzle guide heat shield for a gas turbine engine. 4,322,945, Cl. 60-39.320.

Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,323,459, Cl. 210-700.000.
Quinlan, Patrick M., 4,323,460, Cl. 210-700.000.
Quinlan, Patrick M., 4,323,461, Cl. 210-700.000.

Pettigrew, Robert D., to Beckwith Electric Co., Inc. RMS Controlled load tap changing transformer. 4,323,838, Cl. 323-256.000.

Pfizer Inc.: *See—*
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,323,506, Cl. 260-345.80R.
Myers, Robert F., 4,323,499, Cl. 260-239.100.

Pflugmacher, Ingo: *See—*
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,323,596, Cl. 427-127.000.

Philippi, John: *See—*
Apter, Robert; Philippi, John; Potichko, Nicholas; and Szablewski, Fred. C., 4,323,333, Cl. 417-63.000.

Phillips, John H.: *See—*
Dawson, Peter; and Phillips, John H., 4,323,850, Cl. 324-439.000.

Phillips Petroleum Company: *See—*
Buck, Ollie G., 4,323,606, Cl. 428-35.000.
Swanson, Billy L., 4,323,123, Cl. 166-302.000.

Pickens, Donald: *See—*
Bonfield, John H.; Belsky, Stephen E.; and Pickens, Donald, 4,323,706, Cl. 564-253.000.

Pickett, John H.: *See—*
Mercier, George E.; Pickett, John H.; and Holtzman, Barry L., 4,323,948, Cl. 361-315.000.

Pierce, Laurance. Method and means for emergency shearing and sealing of well casing. 4,323,117, Cl. 166-55.000.

Pietryka, Joseph, to Fives-Cail Babcock. Continuous casting installation. 4,323,107, Cl. 164-416.000.

Pike, John E.: *See—*
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,672, Cl. 542-421.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,673, Cl. 542-426.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,674, Cl. 542-426.000.

Pilkington, G. Roger: *See—*
O'Rourke, J. Cam; Pilkington, G. Roger; and Bercha, Frank G., 4,323,322, Cl. 405-217.000.

Pilot Mannenhitsu Kabushi Kaisha: *See—*
Yoshizawa, Naomi; and Terashima, Akira, 4,323,999, Cl. 369-19.000.

Piltch, Abraham. Squirrel-proof bird feeder. 4,323,035, Cl. 119-51.00R.

Pinamonti, Franco: *See—*
Dal Moro, Anacleto; Pinamonti, Franco; and Capizzi, Amedeo, 4,323,556, Cl. 424-84.000.

Pioneer Container Corp.: *See—*
Grueneberg, Bevan E., 4,323,156, Cl. 206-333.000.

Pioneer Electronic Corporation: *See—*
Kuribayashi, Hiroshi; and Ikeda, Atsuo, 4,323,997, Cl. 369-33.000.
Shimada, Kunihiko; and Tsuchiya, Yukio, 4,323,737, Cl. 179-115.50R.

Pipe Shields, Inc.: *See—*
McClellan, William F., 4,323,088, Cl. 138-106.000.

Pissiotas, Georg; Durr, Dieter; Rohr, Otto; and Lukaszczyk, Alfons, to Ciba-Geigy Corporation. Cyanoalkyl-phenylureas having selective herbicidal activity. 4,323,388, Cl. 71-88.000.

Pistorius, Johannes A.: *See—*
Damen, Johannes P. M.; and Pistorius, Johannes A., 4,323,618, Cl. 428-212.000.

Pitney Bowes Inc.: *See—*
Holtz, Earl B.; Lay, Roger F.; Manduley, Flavio M.; and Moody, Howard J., 4,323,987, Cl. 365-229.000.

Pittet, Andre: *See—*
Xuan, Mai T.; Jufer, Marcel; and Pittet, Andre, 4,323,834, Cl. 318-696.000.

Plessey Handel und Investments AG: *See—*
Stewart, William J.; Robinson, John A.; and Carpenter, Richard, 4,323,300, Cl. 350-96.210.

Plewan, Otto: *See—*
Kraus, Helmut; Weinlich, Jurgen; and Plewan, Otto, 4,323,661, Cl. 525-259.000.

Plum, Douglas B., to E & E Kaye Limited. Inflatable core for use in forming a thermal break in a metal frame for a door or window. 4,323,218, Cl. 249-65.000.

Plympton Patents Limited: *See—*
Jackson, Harold E., 4,323,192, Cl. 236-46.00R.

Poehlman, Arthur G., to Outboard Marine Corporation. Lawn mower including a safety clutch and brake. 4,322,935, Cl. 56-11.300.

Poll, Martin, to D. Swarovski & Co. Decorative material and a process for producing the same. 4,323,611, Cl. 428-67.000.

Pollock, Elisabeth M.: *See—*
Lentz, David J.; and Pollock, Elisabeth M., 4,323,358, Cl. 8-94.110.

Polyakova, Viktoria P.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Gakh, Igor G.; Parbuzina, Iraida L.; Savitsky, Evgeny M.; Polyakova, Viktoria P.; and Roshan, Natalia R., 4,323,708, Cl. 564-418.000.

Polymet Corporation: *See—*
Hunt, James G., 4,323,186, Cl. 228-173.00E.

Pomfret, Colin T., to List, Hans. Noise-insulating enclosure seal. 4,323,253, Cl. 277-12.000.

Popeck, Charles A.: *See—*
Kamp, Eugene L.; Popeck, Charles A.; and Bruning, Armin M., 4,323,871, Cl. 337-7.000.

Porenski, Harry S., Jr.: *See—*
Jenkins, Carl B., Jr.; Porenski, Harry S., Jr.; and Turner, Paul N., 4,323,084, Cl. 131-319.000.

Portescap: *See—*
Caby, Jean-Claude; and Girardin, Jean-Claude, 4,323,805, Cl. 310-237.000.

Porteus, James O.: *See—*
Seitel, Steven C.; Porteus, James O.; and Faith, William N., 4,322,967, Cl. 73-15.600.

Portz, Willi: *See—*
Braun, Albert; Portz, Willi; and Strauss, Georg, 4,323,392, Cl. 75-58.000.

Potekhin, Konstantin F.: *See—*
Danko, Vladimir G.; Ljuty, Boris I.; Chigirinsky, Alexandr A.; Kildishev, Vasily S.; Kuzmin, Viktor V.; Danilevich, Yanush B.; Chubraeva, Lidia I.; Potekhin, Konstantin F.; Maslennikov, Konstantin N.; and Ivanov, Valery K., 4,323,803, Cl. 310-59.000.

Potichko, Nicholas: *See—*
Apter, Robert; Philippi, John; Potichko, Nicholas; and Szablewski, Fred. C., 4,323,333, Cl. 417-63.000.

Pouzoullic, Gerard: *See—*
Boudault, Robert; and Pouzoullic, Gerard, 4,323,862, Cl. 332-9.00R.

PPG Industries, Inc.: *See—*
Carlin, William W., 4,323,435, Cl. 204-98.000.
Criss, Russell C.; and Stofka, Edward J., 4,323,726, Cl. 174-68.500.
Gintert, Dean W.; and Waksmunski, Raymond A., 4,323,385, Cl. 65-351.000.
Welch, Cletus N.; and Snodgrass, John O., 4,323,595, Cl. 427-123.000.

Price, Barry J.: *See—*
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; MacKinnon, John W. M.; Judd, Duncan B.; and Carey, Linda, 4,323,566, Cl. 424-248.510.

Priest, Wayne A., to SOR, Inc. High pressure differential switch device. 4,323,742, Cl. 200-82.00C.

Procter & Gamble Company, The: *See—*
Ahr, Nicholas A.; and Smith, Douglas J., 4,323,069, Cl. 128-287.000.
Aziz, Mohammed I., 4,323,068, Cl. 128-287.000.
Bolich, Raymond E., Jr.; Shaya, Steven A.; and Steuri, Christian, 4,323,683, Cl. 546-6.000.
Compton, Donald B.; Lewis, William P.; and Trinh, Toan, 4,323,193, Cl. 239-44.000.
Cowgill, Ronald H., 4,323,160, Cl. 209-632.000.
DesMarais, Thomas A., 4,323,534, Cl. 264-176.00R.
Parran, John J., Jr., 4,323,551, Cl. 424-54.000.

Pronovost, Normand. Rotary weeding machine. 4,323,125, Cl. 172-59.000.

Proske, Joachim, to Rollei-Werke Franke & Heidecke GmbH & Co. Reflector for varying illumination distribution. 4,323,952, Cl. 362-17.000.

Puritan-Bennett Corporation: *See—*
Hoenig, Richard J.; and Klinikowski, James J., 4,323,064, Cl. 128-204.210.

Pustka, Marvin J., to Esquire, Inc. Lens closure for light fixture and method for attachment. 4,323,956, Cl. 362-374.000.

Queck, Robert: *See—*
Buhring, Otto; Dreessen, Gerardus J. W.; Groeneveld, Jacob W. H.; Queck, Robert; Thome, Heinrich; and Willemsen, Gerrit J., 4,323,718, Cl. 373-73.000.

Quinlan, Patrick M., to Petrolite Corporation. Process of inhibiting scale formation in aqueous systems using quaternary ammonium salts of α-1,4-thiazine alkanephosphonic acids. 4,323,459, Cl. 210-700.000.

Quinlan, Patrick M., to Petrolite Corporation. Process of inhibiting scale formation in aqueous systems using α-1,4-thiazine alkanephosphonic acids. 4,323,460, Cl. 210-700.000.

Quinlan, Patrick M., to Petrolite Corporation. Process of inhibiting scale formation in aqueous systems using di-quaternary ammonium salts of α-1,4-thiazine alkanephosphonic acids. 4,323,461, Cl. 210-700.000.

R. A. Industries: *See—*
Apter, Robert; Philippi, John; Potichko, Nicholas; and Szablewski, Fred. C., 4,323,333, Cl. 417-63.000.

R. J. Reynolds Tobacco Company: *See—*
Long, Margaret E.; and Lee, Chin K., 4,323,651, Cl. 435-207.000.
Serge, Richard F., 4,323,772, Cl. 235-463.000.

Radaelli, Dario; De Angelis, Giancarlo; and Catastini, Alberto, to Alfa Romeo S.p.A. Electronic device for taking the speed of a rotating member. 4,323,976, Cl. 364-565.000.

Radionov, Valery A.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky,

Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Radwill, Robert P., to AMSTED Industries Incorporated. Railway car truck fatigue detector. 4,322,981, Cl. 73-810.000.

Ragan, Marshall P.; and Sytsma, Peter H., to FMC Corporation. Rail-mounted vehicle jack. 4,323,141, Cl. 187-8.470.

Rakow, Marvin S.: *See*—
Chervenak, Michael C.; Johanson, Edwin S.; and Rakow, Marvin S., 4,323,446, Cl. 208-8.00R.

Rambert, Andre; Bousquet, Gilles; and Rigal, Francois. Articulated splint for a knee joint. 4,323,059, Cl. 128-80.00C.

Ramesohl, Hubert: *See*—
Herchenbach, Horst; Ramesohl, Hubert; and Brachthauser, Kunibert, 4,323,397, Cl. 106-100.000.

Ramlow, Bryan L.; and Steele, Richard R., to Atmospheric Energy Systems. Heat collection system. 4,322,953, Cl. 62-217.000.

Ransom F. Shoup & Co., Inc.: *See*—
Shoup, Ransom F., II, 4,323,765, Cl. 235-55.00A.

Rasmussen, Jerome L., to Tecumseh Products Company. Internally vented float bowl primer arrangement. 4,323,522, Cl. 261-72.00R.

Rath, Robert E.: *See*—
Nolte, Robert K.; Rath, Robert E.; and Jarvis, Michael F., 4,323,091, Cl. 134-60.000.

Rathbone, Ronald: *See*—
Murrmann, Helmuth; Rathbone, Ronald; and Schwabe, Ulrich, 4,323,913, Cl. 357-51.000.

Rattner, Manfred: *See*—
Baumann, Heinz; Kuehnel, Werner; and Rattner, Manfred, 4,323,781, Cl. 250-422.000.

Ray, Asit K.; and Reisman, Arnold, to International Business Machines Corporation. Plasma oxidation. 4,323,589, Cl. 427-38.000.

Ray, Charles D.: *See*—
Goode, James W.; Penner, Wayne A.; Ray, Charles D.; and Nelson, Robert G., 4,323,990, Cl. 367-21.000.

Raymond Engineering Inc,: *See*—
Bickford, John H., 4,322,965, Cl. 73-1.00C.

RCA Corporation: *See*—
Bendell, Sidney L., 4,323,918, Cl. 358-50.000.
Benner, Timothy E.; and Month, Alfred, 4,323,814, Cl. 313-390.000.
Chang, Kern K. N., 4,323,816, Cl. 313-433.000.
Dion, Donald F., 4,323,789, Cl. 307-81.000.
Dischert, Robert A.; and Reitmeier, Glenn A., 4,323,916, Cl. 358-13.000.
Fukazawa, Kazuo; and Yamada, Akira, 4,323,998, Cl. 369-43.000.
Nierenberg, Morton J., 4,323,755, Cl. 219-121.0LJ.
Russell, John P., 4,323,815, Cl. 313-422.000.
Sokoloski, Joseph C.; and Ipri, Alfred C., 4,323,910, Cl. 357-23.000.
Vieland, Leon J.; and Cannuli, Vincent M., 4,323,813, Cl. 313-250.000.
Wu, Chin T., 4,323,963, Cl. 364-200.000.

Reash, Clair W.: *See*—
Madden, Thomas H.; and Reash, Clair W., 4,323,818, Cl. 313-481.000.

Reba B.V.: *See*—
Bos, Wouter A., 4,322,898, Cl. 37-64.000.

Recortec, Inc.: *See*—
Chang, David T. L., 4,323,930, Cl. 360-10.000.

Redman, Paul G.: *See*—
Lasker, George; and Redman, Paul G., 4,322,984, Cl. 74-51.000.

Redmond, Stephen L.: *See*—
Fowler, Steven E.; Hennings, George N.; Hibbs, Joseph E.; Redmond, Stephen L.; and Swenson, Richard M., 4,322,998, Cl. 89-1.50D.

Reeck, David L.: *See*—
Iftikar, Syed H.; and Reeck, David L., 4,323,939, Cl. 360-106.000.

Reed, Robert D.; and Schwartz, Robert E., to John Zink Company. Burner assembly for smokeless combustion of low calorific value gases. 4,323,343, Cl. 431-202.000.

Reed Rock Bit Company: *See*—
Childers, John S.; and Mayo, Terry H., 4,323,284, Cl. 308-8.200.

Regenstein, Joseph, Jr., to Arvey Corporation. Closable pouch. 4,323,189, Cl. 229-62.000.

Regie Nationale des Usines Renault: *See*—
Coste, Jean C., 4,323,895, Cl. 340-782.000.

Reisman, Arnold: *See*—
Ray, Asit K.; and Reisman, Arnold, 4,323,589, Cl. 427-38.000.

Reitberger, Peter H.; and Weber, Helmut, to NCR Corporation. Ink droplet sensing means. 4,323,905, Cl. 346-75.000.

Reitmeier, Glenn A.: *See*—
Dischert, Robert A.; and Reitmeier, Glenn A., 4,323,916, Cl. 358-13.000.

Rellick, Joseph R., to Du Pont de Nemours, E. I., and Company. Mixed oxide bonded copper conductor compositions. 4,323,483, Cl. 252-512.000.

Remillard, Gerard J.; Cruz, Frank, Sr.; Devoss, Daniel W., Jr.; and Miller, Truman A., to Otis Engineering Corporation. Chip washing system. 4,322,992, Cl. 82-34.00R.

Rempfler, Hermann: *See*—
Bosshard, Hans; Rempfler, Hermann; and Zweifel, Hans, 4,323,701, Cl. 562-462.000.

Reneau, Daniel L., to Zenith Radio Corporation. AGC-Clamped video amplifier. 4,323,923, Cl. 358-171.000.

Reneau, Daniel L.: *See*—
Engel, Christopher M.; and Reneau, Daniel L., 4,323,917, Cl. 358-28.000.

Rengstl, Johann; and Lutz, Alfons, to Webasto-Werk W. Baier GmbH & Co. Vehicle roof with a cutout to accept a cover and method for its manufacture. 4,323,277, Cl. 296-216.000.

Rensel, Walter B.: *See*—
Masnari, Nino A.; Rensel, Walter B.; Robinson, Merrill G.; Solomon, David E.; Wise, Kensall D.; and Wuttke, Gilbert H., 4,323,420, Cl. 156-628.000.

Reymanova, Marketa: *See*—
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.

Rhodes, Buck A.: *See*—
Crockford, David R.; and Rhodes, Buck A., 4,323,546, Cl. 424-1.000.

Rhodes, Smith A., to Communications Satellite Corporation. Synchronizer for MSK burst communications. 4,324,001, Cl. 375-90.000.

Rhodes, William H.: *See*—
Sellers, David J.; Rhodes, William H.; and Vasilos, Thomas, 4,323,545, Cl. 423-625.000.

Ribka, Joachim: *See*—
Brachten, Gert; Engelhardt, Friedrich; Helling, Heinz; and Ribka, Joachim, 4,323,363, Cl. 8-532.000.

Rice, Lawrence F. Power service mounting system. 4,323,836, Cl. 320-2.000.

Richard, Francoise: *See*—
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,323,549, Cl. 424-45.000.

Richards, Thomas J.: *See*—
Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., 4,323,401, Cl. 148-39.000.

Richmond, Kenneth D., to Dayco Corporation. Apparatus for making multiple rib belts. 4,322,916, Cl. 51-78.000.

Ricker, William F.: *See*—
Auerbach, Les M.; and Ricker, William F., 4,323,051, Cl. 126-77.000.

Ricoh Co., Ltd.: *See*—
Sekigawa, Keiji, 4,323,974, Cl. 364-515.000.

Riedel, Dieter, to Drabert Sohne Minden (Ger. Body Corp.). Endless pressure belts for use in continuous pressing and decatizing devices. 4,323,407, Cl. 156-91.000.

Rigal, Francois: *See*—
Rambert, Andre; Bousquet, Gilles; and Rigal, Francois, 4,323,059, Cl. 128-80.00C.

Riihimaki, Esko; and Savikurki, Seppo, to Hospital Physics Oy. Absorption resolution testing device. 4,323,782, Cl. 250-252.000.

Rinnai Kabushiki Kaisha: *See*—
Takase, Tadayoshi; and Kanaya, Yoshihiro, 4,323,747, Cl. 219-10.55C.

Rising, Robert P., to Perkin-Elmer Corporation, The. Machine for separating bills and coupons. 4,323,230, Cl. 271-12.000.

Riso Kagaku Corporation: *See*—
Hasegawa, Takanori; Shimada, Takanobu; Sato, Takao; Kera, Masakazu; Yoshida, Shuntaro; and Shimoyama, Shinichi, 4,323,775, Cl. 250-317.100.

Ritvanen, Tapio, to Oy Wartsila Ab. Method and arrangement for treating gaseous combustion products. 4,323,371, Cl. 55-19.000.

Rizkalla, Nabil, to Halcon SD Group, Inc., The. Process for preparing ethylidene diacetate. 4,323,697, Cl. 560-232.000.

Robert, Arnold-Michel: *See*—
Marmorat, Andre; and Robert, Arnold-Michel, 4,323,750, Cl. 219-76.100.

Robert Bosch GmbH: *See*—
Muller, Thomas, 4,323,725, Cl. 174-65.00R.
Peter, Cornelius, 4,322,970, Cl. 73-118.000.
Wossner, Gunter; and Maurer, Helmut, 4,322,947, Cl. 60-285.000.

Robert, Edward W.: *See*—
Simpson, John B.; and Robert, Edward W., 4,323,071, Cl. 128-343.000.

Roberts, Calvin W. Wide field specular scanning device. 4,323,299, Cl. 350-91.000.

Roberts Consolidated Industries, Inc.: *See*—
Parker, Thomas G., 4,323,602, Cl. 427-298.000.

Roberts, Michael A.; and Copperthwaite, Martin, to USS Engineers and Consultants, Inc. Method for making a refractory article. 4,323,529, Cl. 264-69.000.

Roberts, Thomas E.: *See*—
Harper, Bruce M.; Billett, Ronald J.; Roberts, Thomas E.; and Viitanen, Veikko K., 4,323,336, Cl. 425-126.00S.

Robertshaw Controls Company: *See*—
Gneiding, Donald R., 4,323,086, Cl. 137-495.000.
Willson, James R.; Conway, William H.; and Smith, William N., 4,323,764, Cl. 219-497.000.

Robinson, Darrell, to Ekstrom Industries, Inc. Meter socket cover assembly. 4,323,294, Cl. 339-19.000.

Robinson, John A.: *See*—
Stewart, William J.; Robinson, John A.; and Carpenter, Richard, 4,323,300, Cl. 350-96.210.

Robinson, Merrill G.: *See*—
Masnari, Nino A.; Rensel, Walter B.; Robinson, Merrill G.; Solomon, David E.; Wise, Kensall D.; and Wuttke, Gilbert H., 4,323,420, Cl. 156-628.000.

Roche, William J.; and Bessone, Carlo S., to GTE Products Corporation. Low voltage fluorescent operating circuit. 4,323,824, Cl. 315-289.000.

Rock, Erich; and Brunner, Josef, to Julius Blum Gesellschaft m.b.H. Suspension fitting for cabinets. 4,323,213, Cl. 248-222.100.

Rockwell International Corporation: *See—*
Boros, Lawrence A., 4,323,753, Cl. 219-107.000.
Boros, Lawrence A., 4,323,754, Cl. 219-107.000.
De Wames, Roger E.; Hall, William F.; Ho, William W.; and Lim, Teong C., 4,323,901, Cl. 343-754.000.
Gerstley, James G., 4,323,858, Cl. 372-107.000.
Haraszti, Tegze P., 4,323,846, Cl. 323-311.000.
Sinor, Jerry E., 4,323,538, Cl. 422-207.000.
Weber, Robert J., 4,323,863, Cl. 333-109.000.

Roehm, Dan C.: *See—*
Siegel, Norman H.; and Roehm, Dan C., 4,323,582, Cl. 424-325.000.

Rogers Corporation: *See—*
Balash, Frederick A., 4,323,740, Cl. 200-5.00A.

Rogers, Ronald J.: *See—*
Keches, Leonidas A.; Goggin, Sharon R.; Isaac, Edward J.; and Rogers, Ronald J., 4,323,247, Cl. 273-235.00R.

Rohm, Fritz. Hair dyeing apparatus. 4,323,085, Cl. 132-113.000.

Rohm and Haas Company: *See—*
Tanger, Charles M., 4,323,692, Cl. 560-65.000.

Rohner, Joachim; and Zumfeld, Heinz, to W. Schlafhorst & Co. Device for joining an upper thread to a lower thread. 4,322,943, Cl. 57-261.000.

Rohr, Otto: *See—*
Pissiotas, Georg; Durr, Dieter; Rohr, Otto; and Lukaszczyk, Alfons, 4,323,388, Cl. 71-88.000.

Roitenberg, Yakov I.: *See—*
Veselovsky, Roman A.; Kuxin, Anatoly N.; Mudrov, Oleg A.; and Roitenberg, Yakov I., 4,323,491, Cl. 524-144.000.

Rolf, Meinhard: *See—*
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,323,670, Cl. 542-415.000.
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,323,671, Cl. 542-415.000.

Rollei-Werke Franke & Heidecke GmbH & Co.: *See—*
Proske, Joachim, 4,323,952, Cl. 362-17.000.

Rollins, Dallas W.: *See—*
Dugge, Richard H.; and Rollins, Dallas W., 4,323,096, Cl. 137-350.000.

Rosch, Gunter: *See—*
Eckes, Helmut; Erckel, Rudiger; Martini, Thomas; and Rosch, Gunter, 4,323,675, Cl. 542-463.000.

Rose, Donald K.: *See—*
Lee, David M.; Rose, Donald K.; and Clover, Richmond B., 4,323,983, Cl. 365-8.000.

Rosenbluth, Robert F.; and Bonchek, Lawrence I., to Shiley, Incorporated. Cannula for a vein distention system. 4,323,072, Cl. 128-348.000.

Rosenfeld, Peter E. Electronic maze game. 4,323,242, Cl. 273-153.00R.

Rosenquest, Arthur P. Dust collector with quick release filter support system for use in dust collectors. 4,323,376, Cl. 55-304.000.

Rosevear, Alan, to United Kingdom Atomic Energy Authority. Immobilization of biologically active substances in a porous support. 4,323,650, Cl. 435-174.000.

Roshan, Natalia R.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Gakh, Igor G.; Parbuzina, Iraida L.; Savitsky, Evgeny M.; Polyakova, Viktoria P.; and Roshan, Natalia R., 4,323,708, Cl. 564-418.000.

Rossmann, Axel: *See—*
Hoffmuller, Wilhelm; Rossmann, Axel; and Schreiber, Franz, 4,323,394, Cl. 75-208.00R.

Rosso, Paul D.; and Moss, Michael Y., to Minnesota Mining & Manufacturing Company. Pressure-sensitive adhesive containing iodine. 4,323,557, Cl. 424-28.000.

Rothschild, Alexander M.: *See—*
Whiteside, Arliss E.; Freedman, Morris D.; Tasar, Omur; and Rothschild, Alexander M., 4,323,966, Cl. 364-200.000.

Rottmaier, Ludwig: *See—*
Merten, Rudolf; and Rottmaier, Ludwig, 4,323,687, Cl. 548-264.000.

Rowe, John P., to Olin Corporation. Self-closing propellant charge package. 4,322,907, Cl. 42-88.000.

Rozenberg, Mark E.: *See—*
Shirinian, Vram T.; Mnatsakanov, Suren S.; Pavljuchenko, Valery N.; Rozenberg, Mark E.; Gromov, Valery V.; and Ivanchev, Sergei S., 4,323,666, Cl. 526-329.000.

RTE Corporation: *See—*
Link, Edwin A., 4,323,874, Cl. 337-244.000.

Rubbright, Harry A.; and Springer, Donald A., to Anchor Hocking Corporation. Food preparation process. 4,323,110, Cl. 165-2.000.

Rubco Products, Inc.: *See—*
Hilbush, Edward O., III, 4,323,526, Cl. 264-36.000.

Rudolph, Andrew W.: *See—*
McComb, Walter D.; and Rudolph, Andrew W., 4,323,785, Cl. 250-461.00R.

Rush, Charles R., to Brunswick Corporation. Camouflage incising geometry. 4,323,605, Cl. 428-17.000.

Russell, Burdsall & Ward Corporation: *See—*
Hess, George M.; and Zils, James A., 4,323,015, Cl. 105-199.0CB.

Russell, John P., to RCA Corporation. Unitary beam guide/electron gun assembly for flat panel display devices. 4,323,815, Cl. 313-422.000.

Russu, Grigory I.: *See—*
Sereda, Alexandr I.; Nyagu, Ivan F.; Smirnov, Igor N.; Russu, Grigory I.; and Yasinovsky, Izrail L., 4,323,004, Cl. 99-275.000.

Saarinen, Heimo U. A.; and Seilo, Matti, to Outokumpu Oy. Selective two stage leaching of nickel from nickel-copper matte. 4,323,541, Cl. 423-37.000.

Sado, Ryoichi, to Shin-Etsu Polymer Co., Ltd. Method for generating electric signals and a push-button switch means therefor. 4,322,983, Cl. 73-862.680.

Sagitta Officina Meccanica S.p.A.: *See—*
Bocca, Alberto; and Pagani, Mario, 4,322,864, Cl. 12-24.500.

Saigusa, Tetsuji: *See—*
Kadono, Mamoru; and Saigusa, Tetsuji, 4,323,089, Cl. 138-109.000.

Saita, Shigeaki; and Nakaoka, Manabu, to Hitachi, Ltd. Circular fluorescent lamp manufacturing apparatus. 4,323,225, Cl. 269-43.000.

Saito, Retsuo; and Nagase, Junji, to Kabushiki Kaisha Tokiwa Seisakusho. Ball shooting machine for volleyball practice. 4,323,048, Cl. 124-78.000.

Saito, Seiji: *See—*
Fujii, Motoharu; Koumura, Noboru; Ayata, Naoki; Saito, Seiji; and Sato, Yasushi, 4,323,919, Cl. 358-75.000.

Saito, Tsutomu: *See—*
Takami, Akio; Matsuura, Toshitaka; and Saito, Tsutomu, 4,322,968, Cl. 73-27.00R.

Sakaida, Tsutomu: *See—*
Uejima, Hiroyuki; Hirai, Masahide; and Sakaida, Tsutomu, 4,323,458, Cl. 210-688.000.

Sakata, Kenji; Yamada, Toshiaki; Uchiyama, Kenji; and Hasegawa, Yugo, to Mitsui Toatsu Chemicals, Inc. Process for metallic coat finishing. 4,323,600, Cl. 427-202.000.

Sakharnov, Vasily A.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galyan, Boris A., 4,323,752, Cl. 219-101.000.

Salam, Hassan P. A., to Unisplay S.A. Matrix display devices. 4,323,889, Cl. 340-373.000.

Saldien, Karel F., to Central Soya Company, Inc. Method of preparing animal feeds. 4,323,584, Cl. 426-285.000.

Salerno, Michael. Automatic watering apparatus. 4,323,036, Cl. 119-81.000.

Sallmann, Alfred: *See—*
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,323,688, Cl. 548-330.000.

Samanta, Shyam K.; Subramanian, Krishnamoorthy; and Ezis, Andre, to Ford Motor Company. Method of using SI3N3.Y2O3.SIO2 ceramic system for machine cast iron. 4,323,325, Cl. 409-131.000.

Sams, Marvin W., to Electro-Cap, Inc. Electrode cap. 4,323,076, Cl. 128-644.000.

Samuel Pegg & Son, Limited: *See—*
Nowicki, Andrzej N.; and Smith, David H., 4,322,957, Cl. 68-13.00R.

Samuelson, Harold. Frame for skate board. 4,323,261, Cl. 280-87.04A.

Sandler, Louis M.; Spofford, Walter R.; and Scott, Charles E., to Emhart Industries, Inc. Oscillator circuit for controlling the power level of a microwave oven. 4,323,861, Cl. 331-111.000.

Sandoz Ltd.: *See—*
Benguerel, Francois, 4,323,498, Cl. 260-187.000.

Sanford, Leon M., deceased: *See—*
Tick, Paul A.; and Sanford, Leon M., deceased, 4,323,654, Cl. 501-47.000.

Sanford, Michele R., administratrix: *See—*
Tick, Paul A.; and Sanford, Leon M., deceased, 4,323,654, Cl. 501-47.000.

Sankyo Company Limited: *See—*
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.
Tanzawa, Kazuhiko; Iwado, Seigo; Tsujita, Yoshio; Kuroda, Masao; and Furuya, Kouhei, 4,323,648, Cl. 435-125.000.

Santoro, Giovanni. Tape recorders of the cassette type. 4,323,937, Cl. 360-96.600.

Sanville, W. Woodward: *See—*
Bambara, Joseph E.; and Sanville, W. Woodward, 4,323,211, Cl. 246-169.00A.

Sarracino, Marcello, to Industrie Pirelli S.p.A. Wire stranding machine with multiple bobbins alternately loaded and used for stranding. 4,322,941, Cl. 57-16.000.

Sartain, John R., to Taco Bell. Manually-operable ratchet type dispenser for comestibles. 4,323,176, Cl. 222-326.000.

Sasaki, Isao; and Kushi, Kenji. Process for producing a shaped article having a mat surface. 4,323,592, Cl. 427-54.100.

Satake Engineering Co., Ltd.: *See—*
Satake, Toshihiko, 4,323,006, Cl. 99-519.000.

Satake, Toshihiko, to Satake Engineering Co., Ltd. Whitening apparatus for super-glossy white rice. 4,323,006, Cl. 99-519.000.

Sato, Hideo: *See—*
Suzuki, Seikou; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Hachino, Hiroaki; and Takahashi, Minoru, 4,322,980, Cl. 73-727.000.

Sato, Tadashi; Hara, Toyoji; and Tomita, Tadashi, to Clarion Co., Ltd. Automatic power supply apparatus. 4,323,787, Cl. 307-38.000.

Sato, Takao: *See—*
Hasegawa, Takanori; Shimada, Takanobu; Sato, Takao; Kera, Masakazu; Yoshida, Shuntaro; and Shimoyama, Shinichi, 4,323,775, Cl. 250-317.100.

Sato Technical Research Laboratory Ltd.: *See—*
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,323,523, Cl. 264-8.000.

Sato, Yasushi: *See*—
Fujii, Motoharu; Koumura, Noboru; Ayata, Naoki; Saito, Seiji; and Sato, Yasushi, 4,323,919, Cl. 358-75.000.

Satoh, Shin: *See*—
Matsuyama, Iwao; Susa, Kenzo; Suganuma, Tsuneo; Satoh, Shin; Katsuyama, Toshio; and Obayashi, Hidehito, 4,323,381, Cl. 65-32.000.

Satoh, Toshihiko, to Canon Kabushiki Kaisha. Device for inserting data into photographs. 4,323,305, Cl. 354-106.000.

Sauder, Myrl D., to Sauder Woodworking Company. Laminated article. 4,323,615, Cl. 428-121.000.

Sauder Woodworking Company: *See*—
Sauder, Myrl D., 4,323,615, Cl. 428-121.000.

Sauer, Hans, to Matsushita Electric Works, Ltd.; and Sauer, Hans. Polarized electromagnetic relay. 4,323,945, Cl. 361-160.000.

Savage, Jack W., to General Motors Corporation. Motor vehicle priority control system for operating leveling and washing systems from a single source of compressed air. 4,323,266, Cl. 280-707.000.

Saviano, Francesco: *See*—
Lagana', Vincenzo; Saviano, Francesco; and Ferrantino, Stanislad, 4,323,252, Cl. 277-12.000.

Savikurki, Seppo: *See*—
Riihimaki, Esko; and Savikurki, Seppo, 4,323,782, Cl. 250-252.000.

Savitsky, Evgeny M.: *See*—
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Gakh, Igor G.; Parbuzina, Iraida L.; Savitsky, Evgeny M.; Polyakova, Viktoria P.; and Roshan, Natalia R., 4,323,708, Cl. 564-418.000.

Sawada, Susumu; Fukuda, Takashi; Tsuchiya, Katsuhiro; and Ito, Kazuo, to Japan Steel Works Ltd., The. Method for providing single piece with plural different mechanical characteristics. 4,323,404, Cl. 148-148.000.

Scala, Thomas L., Jr., to Finetex, Inc. Benzoic acid ester. 4,323,693, Cl. 560-103.000.

Scala, Thomas L., Jr., to Finetex, Inc. Benzoic acid esters. 4,323,694, Cl. 560-103.000.

Scarzello, John F.: *See*—
Krall, Albert D.; McCorkle, John W.; Scarzello, John F.; and Syeles, Albert M., 4,323,900, Cl. 343-700.0MS.

Schachle, Charles; Schachle, Patrick J.; Schachle, Edward C.; and Schachle, John R. Windmill tower. 4,323,331, Cl. 416-9.000.

Schachle, Edward C.: *See*—
Schachle, Charles; Schachle, Patrick J.; Schachle, Edward C.; and Schachle, John R., 4,323,331, Cl. 416-9.000.

Schachle, John R.: *See*—
Schachle, Charles; Schachle, Patrick J.; Schachle, Edward C.; and Schachle, John R., 4,323,331, Cl. 416-9.000.

Schachle, Patrick J.: *See*—
Schachle, Charles; Schachle, Patrick J.; Schachle, Edward C.; and Schachle, John R., 4,323,331, Cl. 416-9.000.

Schaeffer, Howard J., to Burroughs Wellcome Co. Adenine derivatives. 4,323,573, Cl. 424-253.000.

Schaer, Glenn R.; Touyama, Tasuku; Yamamoto, Teruaki; Honda, Keisuke; and Wada, Tatsuo, to Koito Seisakusho Co. Ltd. Apparatus for electroplating strip material without current leakage. 4,323,441, Cl. 204-224.00R.

Schallenberger, John M.; Kmonk, Stanley; and Ferlan, Stephen J., to Westinghouse Electric Corp. Reconstitutable fuel assembly for a nuclear reactor. 4,323,428, Cl. 376-353.000.

Schering Corporation: *See*—
Breslow, Ronald C. D.; and Wilcox, Craig S., 4,323,512, Cl. 260-397.470.

Scherm, Arthur, to Merz & Co. Vaginal suppository for contraception, having a predetermined lactalbumin content. 4,323,548, Cl. 424-44.000.

Schermerhorn, William H. Trim tab for power boat. 4,323,027, Cl. 114-285.000.

Scherz, Michael. Method of and apparatus for examining substances and mixtures of substances. 4,323,364, Cl. 23-230.00R.

Schilling, Bernd, to Consortium fur elektrochemische Ind. GmbH. Process for the manufacture of diazinon. 4,323,678, Cl. 544-243.000.

Schmelzer Corporation: *See*—
Spitzke, Arthur, 4,322,901, Cl. 38-102.600.

Schmid, Helmut: *See*—
Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,323,501, Cl. 260-333.000.

Schmidt, Holger: *See*—
Sukopp, Wolfgang; Schmidt, Holger; and Schwanz, Wilfried, 4,323,278, Cl. 297-481.000.

Schmidt, Peter; and Muhlberger, Emil, to International Standard Electric Corporation. Device for inserting a shadow mask into the faceplate of a color-picture tube. 4,322,876, Cl. 29-25.190.

Schmidt, Robert A.; and Stevens, Ewell E., to Northrop Corporation. Ultrasonic scanner. 4,322,975, Cl. 73-633.000.

Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Dental compositions. 4,323,348, Cl. 433-228.000.

Schmitz-Josten, Robert; Dietrich, Manfred; and Bomer, Bruno, to Bayer Aktiengesellschaft. (Meth)acrylic acid esters of tricyclic decanediols containing ether groups. 4,323,696, Cl. 560-220.000.

Schmolka, Irving R., to BASF Wyandotte Corporation. High foaming dentifrice compositions. 4,323,552, Cl. 424-54.000.

Schneider, Daniel F., III: *See*—
Montle, John F.; Markowski, Henry J.; Lodewyck, Paul D.; and Schneider, Daniel F., III, 4,323,690, Cl. 556-470.000.

Schneider, Dieter: *See*—
Liebrich, Wolfgang; and Schneider, Dieter, 4,323,320, Cl. 404-10.000.

Schnepel, Rudolph R.: *See*—
Logue, Gerald W.; and Schnepel, Rudolph R., 4,323,196, Cl. 239-532.000.

Schnitzius, Klaus: *See*—
Freitag, Herbert; and Schnitzius, Klaus, 4,323,224, Cl. 267-64.120.

Schrader, Glenn L., Jr.: *See*—
Stiles, Alvin B.; and Schrader, Glenn L., Jr., 4,323,482, Cl. 252-462.000.

Schreiber, Franz: *See*—
Hoffmuller, Wilhelm; Rossmann, Axel; and Schreiber, Franz, 4,323,394, Cl. 75-208.00R.

Schrunk, Thomas R. Decorative glass chipping method. 4,323,423, Cl. 156-645.000.

Schuchard, Earl A.: *See*—
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.

Schulte, Karl-Heinz: *See*—
Muhr, Richard; and Schulte, Karl-Heinz, 4,322,994, Cl. 83-616.000.

Schulz, Hans-Hermann: *See*—
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; and Walkowiak, Michael, 4,323,348, Cl. 433-228.000.

Schutten, Herman P.; Jaskolski, Stanley V.; Spellman, Gordon B.; Lade, Robert W.; and Schutten, Michael J., to Eaton Corporation. Thyristor having widened region of temperature sensitivity with respect to breakover voltage. 4,323,793, Cl. 307-252.00R.

Schutten, Michael J.: *See*—
Schutten, Herman P.; Jaskolski, Stanley V.; Spellman, Gordon B.; Lade, Robert W.; and Schutten, Michael J., 4,323,793, Cl. 307-252.00R.

Schwabe, Ulrich: *See*—
Murrmann, Helmuth; Rathbone, Ronald; and Schwabe, Ulrich, 4,323,913, Cl. 357-51.000.

Schwanz, Wilfried: *See*—
Sukopp, Wolfgang; Schmidt, Holger; and Schwanz, Wilfried, 4,323,278, Cl. 297-481.000.

Schwartz, Allen K.: *See*—
Sheridan, John J.; Schwartz, Allen K.; and Anderson, Willis H., 4,323,744, Cl. 200-153.0LB.

Schwartz, Robert E.: *See*—
Reed, Robert D.; and Schwartz, Robert E., 4,323,343, Cl. 431-202.000.

Schwarz, Gunter. Physical training apparatus for holding a person's feet when performing sit-ups. 4,323,235, Cl. 272-93.000.

Schwerko, Albert P.: *See*—
Herrington, Daniel R.; and Schwerko, Albert P., 4,323,508, Cl. 260-346.110.

Sconyers, Larry E. Uniform barbeque cooking of large meat sections. 4,323,005, Cl. 99-400.000.

Scott, Charles E.: *See*—
Sandler, Louis M.; Spofford, Walter R.; and Scott, Charles E., 4,323,861, Cl. 331-111.000.

Scott & Fetzer Company, The: *See*—
Lee, Maw H., 4,323,835, Cl. 318-729.000.

Scott, Kenneth E., to Kenscot Industries Limited. Method of making staircases and staircase made thereby. 4,322,927, Cl. 52-188.000.

Scott, Michael H.: *See*—
Edson, Donald A.; Johnson, Keith I.; and Scott, Michael H., 4,323,759, Cl. 219-137.0PS.

Scott, Robert S.: *See*—
Hartman, Adrian R.; Scott, Robert S.; and Shackle, Peter W., 4,323,942, Cl. 361-56.000.

Secunda, David J.; and Motz, Lloyd. Liquid-solids separation process. 4,323,424, Cl. 159-48.00R.

Seeley, Douglas A., to American Hoechst Corporation. Light beam scanning apparatus. 4,323,307, Cl. 355-51.000.

Seidel, Bernhard: *See*—
Kober, Heinrich; Nippe, Burkhard; and Seidel, Bernhard, 4,323,621, Cl. 428-216.000.

Seifert, Peter: *See*—
Mazanek, Jan; Gipp, Roland; Zollner, Robert; Seifert, Peter; Wagner, Kuuno; and Blahak, Johannes, 4,323,657, Cl. 521-116.000.

Seilo, Matti: *See*—
Saarinen, Heimo U. A.; and Seilo, Matti, 4,323,541, Cl. 423-37.000.

Seitel, Steven C.; Porteus, James O.; and Faith, William N., to United States of America, Navy. Method and apparatus for measuring optical coupling coefficients. 4,322,967, Cl. 73-15.600.

Seki, Kunio; and Ohki, Masahiko, to Morishita Pharmaceutical Co., Ltd. Derivatives of pyrazole for use in therapy. 4,323,576, Cl. 424-273.00P.

Sekigawa, Keiji, to Ricoh Co., Ltd. Method of restoring a picture through estimation. 4,323,974, Cl. 364-515.000.

Sekine, Hisashi: *See*—
Tachikawa, Kyoji; and Sekine, Hisashi, 4,323,402, Cl. 148-133.000.

Sell, Robert C.; Sheler, John R.; and Juhasz, John M., to Bendix Corporation, The. Pressure measuring system. 4,322,977, Cl. 73-701.000.

Sellers, David J.; Rhodes, William H.; and Vasilos, Thomas, to Avco Corporation. Dense alumina with a primary recrystallized polycrystalline structure and crystal orientation. 4,323,545, Cl. 423-625.000.

Sencore, Inc.: *See*—
Winter, Robert A., 4,323,972, Cl. 364-482.000.

Sendai, Michiyuki: *See*—
Tsushima, Susumu; Sendai, Michiyuki; and Shiraishi, Mitsuru, 4,323,676, Cl. 544-22.000.
Seraphin Pumpell & Sohne KG: *See*—
Wolflingseder, Hermann; and Wolflingseder, Werner, 4,322,926, Cl. 52-172.000.
Sereda, Alexandr I.; Nyagu, Ivan F.; Smirnov, Igor N.; Russu, Grigory I.; and Yasinovsky, Izrail L. Installation for preparing multicomponent liquid mixes in production of strong alcoholic liquors. 4,323,004, Cl. 99-275.000.
Serge, Richard F., to R. J. Reynolds Tobacco Company. Bar code reader system. 4,323,772, Cl. 235-463.000.
Servo Corporation of America: *See*—
Bambara, Joseph E.; and Sanville, W. Woodward, 4,323,211, Cl. 246-169.00A.
Sesterhenn, Lothar; and Tomic, Milorad, to Bayer Aktiengesellschaft. Anode for alkali metal chloride electrolysis. 4,323,438, Cl. 204-128.000.
Sethofer, Nicholas L., to Timex Corporation. Liquid crystal composition. 4,323,471, Cl. 252-299.610.
Sethofer, Nicholas L., to Timex Corporation. Liquid crystal admixture 4,323,472, Cl. 252-299.610.
Sethofer, Nicholas L., to Timex Corporation. Cyclohexyl cyclohexyl dioxane liquid crystalline compounds and admixture containing same. 4,323,473, Cl. 252-299.610.
Sethofer, Nicholas L., to Timex Corporation. Cyclohexyl cyclohexyl dioxane liquid crystalline compounds and admixture containing same. 4,323,504, Cl. 260-340.700.
Severson, Larry A., to Branick Mfg., Inc. Self-sealing curing rim for tubeless earthmover tire. 4,323,414, Cl. 156-414.000.
Sextro, Gunter: *See*—
Muck, Karl-Friedrich; Sextro, Gunter; and Burg, Karlheinz, 4,323,502, Cl. 260-340.000.
Seymour, Shaun A., to Sperry Corporation. Stone trapdoor trip mechanism. 4,322,933, Cl. 56-10.200.
Sfredda, Albert P. Flexible coupling. 4,322,955, Cl. 64-16.000.
Shackle, Peter W.: *See*—
Hartman, Adrian R.; Scott, Robert S.; and Shackle, Peter W., 4,323,942, Cl. 361-56.000.
Shannon, Joseph W., to American Beverage Control. Beverage dispenser pumping system to maintain live pressure after shut off. 4,323,173, Cl. 222-136.000.
Sharp Kabushiki Kaisha: *See*—
Koizumi, Satoru; Shimamura, Takashi; and Uchiyama, Sadao, 4,323,935, Cl. 360-73.000.
Yoshida, Kunio, 4,323,767, Cl. 235-92.0SH.
Shasta Industries, Inc.: *See*—
Gould, Henry D., 4,322,860, Cl. 4-490.000.
Shaw, Herbert J.; and Chodorow, Marvin, to United States of America, Air Force. Fiber optic rotation sensing interferometer. 4,323,310, Cl. 356-350.000.
Shaya, Steven A.: *See*—
Bolich, Raymond E., Jr.; Shaya, Steven A.; and Steuri, Christian, 4,323,683, Cl. 546-6.000.
Shearin, Robert W., to Facet Enterprises, Inc. Air filter panel. 4,323,379, Cl. 55-511.000.
Shedd, Walter M.; and LaPierre, Donald C., to United States of America, Air Force. Wide range multiple time mark generator. 4,323,851, Cl. 328-72.000.
Sheehan, John C.: *See*—
Sheehan, Laurence M.; and Sheehan, John C., 4,322,954, Cl. 62-371.000.
Sheehan, Laurence M.; and Sheehan, John C. Portable cooler for medicine. 4,322,954, Cl. 62-371.000.
Sheler, John R.: *See*—
Sell, Robert C.; Sheler, John R.; and Juhasz, John M., 4,322,977, Cl. 73-701.000.
Shell Oil Company: *See*—
Huckabee, Kermit D.; Adair, James C; and Worrell, Gene T., 4,323,989, Cl. 367-17.000.
Sheridan, John J.; Schwartz, Allen K.; and Anderson, Willis H., to General Motors Corporation. Switch for controlling a plurality of lighting circuits. 4,323,744, Cl. 200-153.0LB.
Sherwin, Owen W.: *See*—
Newbold, Don; and Sherwin, Owen W., 4,323,194, Cl. 239-177.000.
Shibata, Hiroshi: *See*—
Enomoto, Tatsuya; and Shibata, Hiroshi, 4,322,881, Cl. 29-571.000.
Shibata, Toshihiro: *See*—
Kubota, Naohiro; and Shibata, Toshihiro, 4,323,684, Cl. 546-19.000.
Shibuya Kogyo Company, Ltd.: *See*—
Hasegawa, Yasuyuki, 4,323,317, Cl. 400-118.000.
Shiley, Incorporated: *See*—
Rosenbluth, Robert F.; and Bonchek, Lawrence I., 4,323,072, Cl. 128-348.000.
Shimada, Kunihiko; and Tsuchiya, Yukio, to Pioneer Electronic Corporation. Driver unit for planar diaphragm type loudspeaker. 4,323,737, Cl. 179-115.50R.
Shimada, Takanobu: *See*—
Hasegawa, Takanori; Shimada, Takanobu; Sato, Takao; Kera, Masakazu; Yoshida, Shuntaro; and Shimoyama, Shinichi, 4,323,775, Cl. 250-317.100.
Shimamura, Takashi: *See*—
Koizumi, Satoru; Shimamura, Takashi; and Uchiyama, Sadao, 4,323,935, Cl. 360-73.000.
Shimano Industrial Company, Limited: *See*—
Fukui, Seiji, 4,323,146, Cl. 192-6.00A.
Nagano, Masashi, 4,323,357, Cl. 474-82.000.
Shimogawa, Toshiaki: *See*—
Tsuge, Noboru; Kuwakado, Satosi; and Shimogawa, Toshiaki, 4,323,205, Cl. 242-107.40A.
Shimoyama, Shinichi: *See*—
Hasegawa, Takanori; Shimada, Takanobu; Sato, Takao; Kera, Masakazu; Yoshida, Shuntaro; and Shimoyama, Shinichi, 4,323,775, Cl. 250-317.100.
Shin-Etsu Chemical Company Limited: *See*—
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,323,488, Cl. 528-32.000.
Shin-Etsu Polymer Co., Ltd.: *See*—
Sado, Ryoichi, 4,322,983, Cl. 73-862.680.
Shinagawa, Takehisa; and Inoue, Tsunehiko, to Nitta Belting Co., Ltd. Air filter assembly. 4,323,374, Cl. 55-132.000.
Shine, William P. Unitary insertable self-anchoring poke-thru wiring device. 4,323,724, Cl. 174-48.000.
Shinoda, Isao: *See*—
Nichimoto, Susumu; Shinoda, Isao; Nakamura, Shigeo; and Tsumura, Haruhide, 4,323,148, Cl. 194-100.00A.
Shinohara, Koichi: *See*—
Kunieda, Toshiaki; Odagiri, Masaru; Fujita, Takashi; and Shinohara, Koichi, 4,323,629, Cl. 428-457.000.
Shinto Paint Co., Ltd.: *See*—
Okajima, Mutsuo; and Hisada, Hideo, 4,323,195, Cl. 239-215.000.
Shipley, Randall S.: *See*—
Lowery, Kirby, Jr.; Birkelbach, Donald F.; and Shipley, Randall S., 4,323,665, Cl. 526-122.000.
Shiraishi, Mitsuru: *See*—
Tsushima, Susumu; Sendai, Michiyuki; and Shiraishi, Mitsuru, 4,323,676, Cl. 544-22.000.
Shirinian, Vram T.; Mnatsakanov, Suren S.; Pavljuchenko, Valery N.; Rozenberg, Mark E.; Gromov, Valery V.; and Ivanchev, Sergei S. Copolymers of vinyl acetate, ethylene and peroxy alkyl acrylate. 4,323,666, Cl. 526-329.000.
Shoup, Ransom F., II, to Ransom F. Shoup & Co., Inc. Vertical reversible lifter piece. 4,323,765, Cl. 235-55.00A.
Shugart Technology: *See*—
Iftikar, Syed H.; and Reeck, David L., 4,323,939, Cl. 360-106.000.
Siebenborn, Wolfgang: *See*—
Moltner, Hermann; and Siebenborn, Wolfgang, 4,323,971, Cl. 364-469.000.
Siegel, Norman H.; and Roehm, Dan C. Method of treating animals and humans for internal and external parasites. 4,323,582, Cl. 424-325.000.
Sielaff GmbH & Co.: *See*—
Kolbl, Richard; and Mehlan, Bernd, 4,323,147, Cl. 194-48.000.
Siemens Aktiengesellschaft: *See*—
Baumann, Heinz; Kuehnel, Werner; and Rattner, Manfred, 4,323,781, Cl. 250-422.000.
Bergman, Ola; Hagen, Rolf; Harenberg, Juergen; and Steiner, Herbert, 4,323,728, Cl. 178-3.000.
Bradler, Peter, 4,323,831, Cl. 318-245.000.
Brunner, Heinrich; and Fischer, Karin, 4,323,970, Cl. 364-436.000.
Conrad, Bernhard, 4,323,784, Cl. 250-445.00T.
Distler, Walter; and Kintopp, Erich, 4,323,783, Cl. 250-445.00T.
Eichrodt, Dieter; and Elsen, Friedhelm, 4,323,982, Cl. 364-786.000.
Fromm, Ingrid, 4,322,978, Cl. 73-705.000.
Fromm, Ingrid, 4,322,979, Cl. 73-705.000.
Leistner, Werner, 4,323,802, Cl. 310-59.000.
Murrmann, Helmuth; Rathbone, Ronald; and Schwabe, Ulrich, 4,323,913, Cl. 357-51.000.
Westermayer, Joerg, 4,323,729, Cl. 178-22.010.
Siemens-Allis, Inc.: *See*—
Peek, Henry L., 4,323,743, Cl. 200-148.00F.
Siemens Gammasonics, Inc.: *See*—
Arseneau, Roger E., 4,323,977, Cl. 364-571.000.
Siemens Medical Laboratories, Inc.: *See*—
Tombaugh, Dennis; Martinsen, Nick; Symmons, Edgar B.; and Heinz, Lothar, 4,323,780, Cl. 250-419.000.
Sigma Chemical Corporation: *See*—
Swan, Philip G., 4,323,124, Cl. 166-303.000.
Silken, Howard. Router guide. 4,323,100, Cl. 144-134.00D.
Silvestrini, Vittorio; Peraldo, Mario; and Monza, Enrico, to Montedison S.p.A. Covering element screening off the solar radiation for the applications in the refrigeration by radiation. 4,323,619, Cl. 428-212.000.
Simandi, Laszlo: *See*—
Lugosi, Gyorgy; May, Antal S.; Bodnar, Janos; Turcsan, Istvan; Jelinek, Istvan; Somfai, Eva; and Simandi, Laszlo, 4,323,469, Cl. 252-182.000.
Simmering-Graz-Pauker Aktiengesellschaft fur Maschinen-, Kessel-und Waggonbau: *See*—
Entzmann, Karl, 4,323,448, Cl. 208-85.000.
Simon, Andrew. Performing maintenance operations on heat exchanger tube bundles. 4,323,398, Cl. 134-18.000.
Simpson, John B.; and Robert, Edward W., to Advanced Catheter Systems, Inc. Vascular guiding catheter assembly and vascular dilating catheter assembly and a combination thereof and methods of making the same. 4,323,071, Cl. 128-343.000.
Sims, George R., to Nikolaus Sorg GmbH & Co. KG. Method and apparatus for uniformly heating a glass stream within the feeder of a glass melting furnace. 4,323,383, Cl. 65-135.000.
Singer Company, The: *See*—
Beckerman, Howard L.; and Dob, Allan M., 4,323,023, Cl. 112-158.00F.

Jones, Gary D.; Laidig, Manfred R.; and Weisz, William, 4,323,024, Cl. 112-237.000.

Singh, Prithipal: *See—*
Leung, Danton K.; and Singh, Prithipal, 4,323,507, Cl. 260-345.90R.

Sinor, Jerry E., to Rockwell International Corporation. Hydrogenation apparatus. 4,323,538, Cl. 422-207.000.

Sira Institute Limited: *See—*
West, Robert N.; West, Patricia A.; Barker, Andrew J.; and Hall, Rosemary J., 4,323,311, Cl. 356-431.000.

Sisson, Edwin D.; Stoutenburg, Donn V.; and Thomas, Glen H., to IRD Mechanalysis, Inc. Mechanical vibration analyzer. 4,322,976, Cl. 73-659.000.

Sjostrom, Svend O.: *See—*
Fauerskov, Svend E.; and Sjostrom, Svend O., 4,323,903, Cl. 346-32.000.

Skarvada, Thomas, to Crane Co. Apparatus for generating a reference signal in a brake control system. 4,323,969, Cl. 364-426.000.

Skoda, Jiri: *See—*
Vosyka, Josef; and Skoda, Jiri, 4,323,033, Cl. 119-14.040.

Slack, Otto G. Template alignment device. 4,323,327, Cl. 414-28.000.

Slobodzian, Gregory E.: *See—*
Fiedler, Wayne; and Slobodzian, Gregory E., 4,323,896, Cl. 340-800.000.

Sloop, Conrad B. Camera shoulder case. 4,323,180, Cl. 224-202.000.

Smirnov, Igor N.: *See—*
Sereda, Alexandr I.; Nyagu, Ivan F.; Smirnov, Igor N.; Russu, Grigory I.; and Yasinovsky, Izrail L., 4,323,004, Cl. 99-275.000.

Smith, David H.: *See—*
Nowicki, Andrzej N.; and Smith, David H., 4,322,957, Cl. 68-13.00R.

Smith, Douglas J.: *See—*
Ahr, Nicholas A.; and Smith, Douglas J., 4,323,069, Cl. 128-287.000.

Smith, Edward M., to Borg-Warner Corporation. D-C Power supply for providing non-interruptible d-c voltage. 4,323,788, Cl. 307-66.000.

Smith, Harvey E., Sr.; and Weis, Siegfried K., to C. L. Frost & Son, Inc. Bearing unit with improved inner race. 4,323,288, Cl. 308-196.000.

Smith, Lee R.: *See—*
Mackey, William H.; and Smith, Lee R., 4,323,630, Cl. 428-542.000.

Smith, Lowell S., to General Electric Company. Acoustic intensity monitor. 4,323,077, Cl. 128-660.000.

Smith, Ronald E.: *See—*
DeRouen, Joseph R.; and Smith, Ronald E., 4,323,293, Cl. 339-17.0CR.

Smith, Stephen H., to Hybricon, Inc. Coulometer. 4,323,849, Cl. 324-428.000.

Smith, William N.: *See—*
Willson, James R.; Conway, William H.; and Smith, William N., 4,323,764, Cl. 219-497.000.

Smolin, Jury I.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Snamprogetti S.p.A.: *See—*
Lagana', Vincenzo; Saviano, Francesco; and Ferrantino, Stanislad, 4,323,252, Cl. 277-12.000.

Snodgrass, John O.: *See—*
Welch, Cletus N.; and Snodgrass, John O., 4,323,595, Cl. 427-123.000.

Snow, David H., to Sparton Corporation. Seam detection and control system. 4,323,786, Cl. 250-559.000.

Snowden, Paul, to Imperial Chemical Industries Limited. Production of fibres. 4,323,524, Cl. 264-8.000.

Snyder, Dennis. Laminate material. 4,323,613, Cl. 428-111.000.

Sobel, Johannes: *See—*
Bergthaller, Peter; Himmelmann, Wolfgang; and Sobel, Johannes, 4,323,646, Cl. 430-622.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Canavesi, Roberto; Ligorati, Ferdinando; and Aglietti, Giancarlo, 4,323,716, Cl. 570-243.000.

Societe Anonyme dite: Delle-Alsthom: *See—*
Orgeret, Lucien, 4,323,720, Cl. 174-21.0JS.

Societe Chimique des Charbonnages SA: *See—*
Meyer, Nicolas; and Foulon, Raymond, 4,323,667, Cl. 528-138.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Dieffenbacher, Albrecht, 4,323,514, Cl. 260-412.300.

Societe d'Etude de Systems Avances et d'Amenagements: *See—*
Dieulot, Gerard; Juan, Mathias; and Fardeau, Michel, 4,323,770, Cl. 235-375.000.

Societe d'Etudes Scientifiques et Industrielles de L'ile-de-France: *See—*
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Colligon, Claude, 4,323,503, Cl. 260-340.300.

Societe Nationale Industrielle Aerospatiale: *See—*
Durandeau, Michel; Voisin, Norbert; and Verdier, Jean P., 4,323,884, Cl. 340-347.0DA.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Xuan, Mai T.; Jufer, Marcel; and Pittet, Andre, 4,323,834, Cl. 318-696.000.

Soderberg, Richard; Winter, Steven; and Burst, Hermann, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Rear for a passenger car. 4,323,274, Cl. 296-1.00S.

Soderblom, Olof; and Karlsen, Lasse K., to Swedair AB. Indicator apparatus for determining the miss distance of a projectile in relation to a fixed or moving target. 4,323,993, Cl. 367-127.000.

Sogn, Leland T. Quartz wafering machine. 4,323,049, Cl. 125-13.00R.

Sokoloski, Joseph C.; and Ipri, Alfred C., to RCA Corporation. MNOS Memory transistor. 4,323,910, Cl. 357-23.000.

Solomon, David E.: *See—*
Masnari, Nino A.; Rensel, Walter B.; Robinson, Merrill G.; Solomon, David E.; Wise, Kensall D.; and Wuttke, Gilbert H., 4,323,420, Cl. 156-628.000.

Somfai, Eva: *See—*
Lugosi, Gyorgy; May, Antal S.; Bodnar, Janos; Turcsan, Istvan; Jelinek, Istvan; Somfai, Eva; and Simandi, Laszlo, 4,323,469, Cl. 252-182.000.

Sommers, Edward G., Jr.; and O'Connor, James G., to General Electric Company. Burner ignition and control system. 4,323,342, Cl. 431-66.000.

Sony Corporation: *See—*
Watanabe, Masanao; Naito, Keiichi; Odajima, Tooru; and Fujiwara, Yoshio, 4,323,659, Cl. 525-108.000.

SOR, Inc.: *See—*
Priest, Wayne A., 4,323,742, Cl. 200-82.00C.

Sorteberg, Johannes. Self-aligning scaling load cell. 4,323,769, Cl. 235-200.0WB.

Southern Foundry Supply Company: *See—*
Kruesi, Paul R.; and Frahm, Veryl H., Jr., 4,323,390, Cl. 75-0.50A.

Sowards, Lorin F. Doorbell for pets. 4,323,883, Cl. 340-328.000.

Space Odyssey Ltd.: *See—*
Goldsmith, Bruce W., 4,323,351, Cl. 434-274.000.

Sparks, Gregory W.: *See—*
Loveland, William A.; Dukes, James S.; and Sparks, Gregory W., 4,323,251, Cl. 273-407.000.

Sparton Corporation: *See—*
Snow, David H., 4,323,786, Cl. 250-559.000.

Spasoff, John. Belt-mounted fishing tackle carrier. 4,323,181, Cl. 224-253.000.

Specialty Papers Company, The: *See—*
Neumann, Robert G., 4,322,929, Cl. 53-451.000.

Spector, Donald. Collapsible rear/front projection screen assembly. 4,323,301, Cl. 350-117.000.

Spector, George: *See—*
Warren, William; and Spector, George, 4,323,352, Cl. 440-27.000.

Spellman, Gordon B.: *See—*
Schutten, Herman P.; Jaskolski, Stanley V.; Spellman, Gordon B.; Lade, Robert W.; and Schutten, Michael J., 4,323,793, Cl. 307-252.00R.

Speranza, George P.; and Zimmerman, Robert L., to Texaco Inc. Polyisocyanurates from diols modified with epoxy resins. 4,323,658, Cl. 521-174.000.

Sperry Corporation: *See—*
Barnes, Richard M.; Vachula, George M.; and Bennett, Clarence L., Jr., 4,323,898, Cl. 343-5.0SA.
Barnes, Richard M.; and Vachula, George M., 4,323,899, Cl. 343-55.00A.
Clark, Charles A., Jr.; and Easter, Finis C., 4,323,957, Cl. 363-21.000.
Eibner, Jules A., 4,323,932, Cl. 360-45.000.
Jacoby, George V., 4,323,931, Cl. 360-40.000.
Seymour, Shaun A., 4,322,933, Cl. 56-10.200.

Spilker, James J., Jr., to Lockheed Missiles & Space Company, Inc. Delay-modulated random energy intelligence communication system. 4,324,002, Cl. 455-27.000.

Spin Physics, Inc.: *See—*
Giraud, Andre, 4,323,934, Cl. 360-61.000.

Spires, Dewayne A.: *See—*
Carriere, Joseph F.; Gaunt, Wilmer B., Jr.; Landry, Joseph E.; and Spires, Dewayne A., 4,323,885, Cl. 340-347.0CC.

Spirig, Ernst. Solder removing device. 4,323,631, Cl. 428-605.000.

Spitzke, Arthur, to Schmelzer Corporation. Needlework frame. 4,322,901, Cl. 38-102.600.

Spofford, Walter R.: *See—*
Sandler, Louis M.; Spofford, Walter R.; and Scott, Charles E., 4,323,861, Cl. 331-111.000.

Spooner, Leonard: *See—*
Vink, Walter; Spooner, Leonard; and Mackay, Donald A. M., 4,323,588, Cl. 426-564.000.

Spooner, Robert J.: *See—*
Chalker, Oliver H., Jr.; and Spooner, Robert J., 4,323,771, Cl. 235-377.000.

Sprague Electric Company: *See—*
Bernard, Walter J., 4,323,950, Cl. 361-433.000.

Springer, Donald A.: *See—*
Rubbright, Harry A.; and Springer, Donald A., 4,323,110, Cl. 165-2.000.

Springthorpe, Anthony J.: *See—*
Noad, Julian P.; Springthorpe, Anthony J.; and Look, Christopher M., 4,323,859, Cl. 372-46.000.

Spurgat, Jimmy C.: *See—*
Fitzpatrick, Cecil C.; and Spurgat, Jimmy C., 4,322,963, Cl. 72-387.000.

Sraitr, Stanislav; and Srejberova, Hana, to Elitex, koncern textilniho strojirenstvi. Method of and apparatus for break spinning yarn. 4,322,944, Cl. 57-328.000.

Srejberova, Hana: *See—*
Sraitr, Stanislav; and Srejberova, Hana, 4,322,944, Cl. 57-328.000.
Stabilus GmbH: *See—*
Freitag, Herbert; and Schnitzius, Klaus, 4,323,224, Cl. 267-64.120.
Stackpole Corporation, The: *See—*
Zelt, Edward J., 4,323,804, Cl. 310-72.000.
Stafford, Donald C.; and Allo, Vincent F., to Chicago Bridge & Iron Company. Shell and tube heat exchanger with polymeric tube sheets. 4,323,115, Cl. 165-79.000.
Staker, William C., Jr.: *See—*
Hussey, James L.; Miller, Michael B.; and Staker, William C., Jr., 4,323,902, Cl. 343-903.000.
Standard Oil Company: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,323,703, Cl. 562-546.000.
Hardman, Harley F.; Callahan, James L.; and Grasselli, Robert K., 4,323,520, Cl. 260-465.900.
Herrington, Daniel R.; and Schwerko, Albert P., 4,323,508, Cl. 260-346.110.
Standard Oil Company (Indiana): *See—*
Ginsburgh, Irwin; and Hall, Robert D., 4,323,120, Cl. 166-251.000.
Ginsburgh, Irwin; and Hall, Robert D., 4,323,121, Cl. 166-251.000.
Kaduk, James A., 4,323,481, Cl. 252-455.00Z.
Keske, Robert G.; and Stephens, James R., 4,323,493, Cl. 524-451.000.
Stanek, Jaroslav: *See—*
Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, 4,323,560, Cl. 424-177.000.
Stapel, Cornelis: *See—*
Vennix, Johannus A.; and Stapel, Cornelis, 4,323,817, Cl. 313-440.000.
Stark, Virgil. Solar energy system. 4,323,052, Cl. 126-440.000.
Starkey, David: *See—*
Wangard, William; and Starkey, David, 4,322,996, Cl. 84-1.240.
State Wide Aluminum of Indiana, Inc.: *See—*
McGaughey, Donald C., 4,322,914, Cl. 49-370.000.
Staudinger, Gernot, to Voest-Alpine AG. Apparatus for the gasification of coal. 4,323,366, Cl. 48-73.000.
Steag Aktiengesellschaft: *See—*
Meyer-Kahrweg, Helmut, 4,323,037, Cl. 122-4.00D.
Steele, Richard R.: *See—*
Ramlow, Bryan L.; and Steele, Richard R., 4,322,953, Cl. 62-217.000.
Steigerwald, Robert L., to General Electric Company. High efficiency rectifier with multiple outputs. 4,323,962, Cl. 363-127.000.
Steinback, Clarence I., to Acrometal Products, Inc. Abrasive grinding machine. 4,322,918, Cl. 51-138.000.
Steiner, Herbert: *See—*
Bergman, Ola; Hagen, Rolf; Harenberg, Juergen; and Steiner, Herbert, 4,323,728, Cl. 178-3.000.
Steinhilber, Jiri. Multiple-trouser-hanger. 4,323,162, Cl. 211-100.000.
Stella, Leo; and Marola, America E., to Torrington Company, The. Bearing seal. 4,323,287, Cl. 308-187.100.
Stenograph Corporation: *See—*
Fowler, Paul J.; and Zum Bahlen, Ralph E., 4,323,316, Cl. 400-91.000.
Stenzel, Wolfgang; Fleck, Wolfgang; Cohnen, Erich; and Armah, Ben, to Beiersdorf Aktiengesellschaft. Substituted aminopyrimidines. 4,323,570, Cl. 424-251.000.
Stepanek, Miroslav: *See—*
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.
Stephens, James R.: *See—*
Keske, Robert G.; and Stephens, James R., 4,323,493, Cl. 524-451.000.
Stephenson, Donald K., to Outboard Marine Corporation. Marine transmission control with vibration isolation system. 4,323,356, Cl. 440-86.000.
Steuri, Christian: *See—*
Bolich, Raymond E., Jr.; Shaya, Steven A.; and Steuri, Christian, 4,323,683, Cl. 546-6.000.
Stevens, Ewell E.: *See—*
Schmidt, Robert A.; and Stevens, Ewell E., 4,322,975, Cl. 73-633.000.
Stevens, Leonard W.: *See—*
Peterson, Steven C.; Stevens, Leonard W.; and Tanrikut, Ibrahim S., 4,322,945, Cl. 60-39.320.
Stewart, Charles G.; Stewart, Nellie R.; Hicks, Floyd E.; and Hicks, Maxine. Bowling game. 4,323,240, Cl. 273-85.00R.
Stewart, Clarence E.: *See—*
Oberg, Robert E.; Stewart, Clarence E.; and Geelan, Thomas C., 4,323,313, Cl. 366-142.000.
Stewart, David G.: *See—*
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,323,475, Cl. 252-373.000.
Stewart, Nellie R.: *See—*
Stewart, Charles G.; Stewart, Nellie R.; Hicks, Floyd E.; and Hicks, Maxine, 4,323,240, Cl. 273-85.00R.
Stewart-Warner Corporation: *See—*
Fiedler, Wayne; and Slobodzian, Gregory E., 4,323,896, Cl. 340-800.000.
Stewart, William J.; Robinson, John A.; and Carpenter, Richard, to Plessey Handel und Investments AG. Optical fibre connectors. 4,323,300, Cl. 350-96.210.
Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm: *See—*
Berggren, Benny, 4,323,745, Cl. 219-10.55A.
Stikeleather, Larry F.; and Totten, David S., to Allis-Chalmers Corporation. Ridge mulch tillage method and apparatus. 4,323,126, Cl. 172-147.000.
Stiles, Alvin B.; and Schrader, Glenn L., Jr., to University of Delaware. Catalyst and method of preparation. 4,323,482, Cl. 252-462.000.
Stirbis, James S.: *See—*
McMillin, Danny L.; and Stirbis, James S., 4,323,601, Cl. 427-287.000.
Stocklin, Gerhard: *See—*
Knust, Ernst J.; Kupfernagel, Christiane; and Stocklin, Gerhard, 4,323,547, Cl. 424-1.000.
Stofka, Edward J.: *See—*
Criss, Russell C.; and Stofka, Edward J., 4,323,726, Cl. 174-68.500.
Stone, John: *See—*
Belsterling, Charles A.; and Stone, John, 4,323,830, Cl. 318-158.000.
Storek, Jaroslav: *See—*
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.
Stoutenburg, Donn V.: *See—*
Sisson, Edwin D.; Stoutenburg, Donn V.; and Thomas, Glen H., 4,322,976, Cl. 73-659.000.
Strata Bit Corporation: *See—*
Dennis, Mahlon, 4,323,130, Cl. 175-329.000.
Strauss, Georg: *See—*
Braun, Albert; Portz, Willi; and Strauss, Georg, 4,323,392, Cl. 75-58.000.
Strickland, James C. Step-up circuit for driving full-range-element electrostatic loudspeakers. 4,323,736, Cl. 179-111.00R.
Strickler, Rainer: *See—*
Vogel, Hans-Henning; Strickler, Rainer; Oppenlaender, Knut; and Baur, Richard, 4,323,689, Cl. 548-336.000.
Strickman, Melvyn B.: *See—*
Strickman, Robert L.; and Strickman, Melvyn B., 4,323,656, Cl. 521-109.000.
Strickman, Robert L.; and Strickman, Melvyn B. Polyurethane sponges manufactured with additive dispersed therein. 4,323,656, Cl. 521-109.000.
Strobel, Heinrich, to Frieseke & Hoepfner GmbH. Controlling the thickness of moving webs of material. 4,322,971, Cl. 73-159.000.
Stubbs, Graham S.: *See—*
den Toonder, Pieter; Doles, Glenn P.; Lund, John A.; Merrell, Richard G.; and Stubbs, Graham S., 4,323,922, Cl. 358-117.000.
Stumpf, Gunter O. Arrangement in a cutting apparatus for engaging and retaining a web-like material, particularly superposed material webs. 4,322,993, Cl. 83-422.000.
Styles, Virgil L.: *See—*
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,323,679, Cl. 544-256.000.
Suarez, Tulio; and Jones, C. David, to Eli Lilly and Company. Antifertility compounds. 4,323,707, Cl. 564-324.000.
Subramanian, Krishnamoorthy: *See—*
Samanta, Shyam K.; Subramanian, Krishnamoorthy; and Ezis, Andre, 4,323,325, Cl. 409-131.000.
Suchy, Adalbert W. Folding chair and cart. 4,323,260, Cl. 280-47.250.
Suganuma, Tsuneo: *See—*
Matsuyama, Iwao; Susa, Kenzo; Suganuma, Tsuneo; Satoh, Shin; Katsuyama, Toshio; and Obayashi, Hidehito, 4,323,381, Cl. 65-32.000.
Sugiura, Shigekata, to Alps Electric Co., Ltd. Lock structure for integrating a cabinet cover and a bottom plate. 4,323,807, Cl. 312-284.000.
Sugiyama, Matsuyoshi: *See—*
Morishita, Teru; Sugiyama, Matsuyoshi; and Suzuki, Toshikazu, 4,323,197, Cl. 239-703.000.
Sukopp, Wolfgang; Schmidt, Holger; and Schwanz, Wilfried, to Volkswagenwerk Aktiengesellschaft. Seat for vehicles, in particular two-door passenger automobiles. 4,323,278, Cl. 297-481.000.
Suma, Atsushi: *See—*
Yamazaki, Kazuhide; Ogawa, Shigetoshi; Suma, Atsushi; and Nakajima, Maki, 4,323,014, Cl. 104-13.000.
Sumitomo Chemical Company Limited: *See—*
Takahashi, Masatoshi; Kotera, Norio; Uegaki, Masatoshi; Miyaoka, Takashi; and Maegawa, Yuzo, 4,323,431, Cl. 203-72.000.
Sun, Anthony M.; and Parisius, Wolf J., to Connaught Laboratories Limited. Artificial endocrine pancreas. 4,323,457, Cl. 210-645.000.
Sundar, Parameshwaran S., to Westinghouse Electric Corp. Reduction of iron precipitation in uranium extraction process. 4,323,540, Cl. 423-10.000.
Super Products Corporation: *See—*
Wurster, James C., 4,322,868, Cl. 15-302.000.
Susa, Kenzo: *See—*
Matsuyama, Iwao; Susa, Kenzo; Suganuma, Tsuneo; Satoh, Shin; Katsuyama, Toshio; and Obayashi, Hidehito, 4,323,381, Cl. 65-32.000.
Sutherland, Ben E. Locking system for a train car coupler. 4,323,164, Cl. 213-145.000.
Sutherland, Joseph E.: *See—*
Dunning, Stephen C.; and Sutherland, Joseph E., 4,323,790, Cl. 370-102.000.
Suzuki, Eiji: *See—*
Ogawa, Kazuo; Suzuki, Eiji; Kurita, Osamu; and Horikawa, Izumi, 4,323,864, Cl. 333-165.000.

Suzuki, Hideaki; and Yamashita, Gentaro, to Teijin Limited. Albumin-fixed resin, production thereof, and therapeutical use thereof. 4,323,486, Cl. 525-54.100.
Suzuki, Masane: *See*—
Oka, Yoshitake; Ishihara, Tetsuo; Suzuki, Masane; and Kanaya, Motonori, 4,323,757, Cl. 219-121.0LN.
Suzuki, Sadahide: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,323,135, Cl. 180-228.000.
Suzuki, Seikou; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Hachino, Hiroaki; and Takahashi, Minoru, to Hitachi, Ltd. Semiconductor pressure sensor having plural pressure sensitive diaphragms and method. 4,322,980, Cl. 73-727.000.
Suzuki, Shizuo: *See*—
Ishihara, Hideo; Suzuki, Shizuo; and Nakabo, Satoru, 4,323,984, Cl. 365-10.000.
Suzuki, Toshikazu: *See*—
Morishita, Teru; Sugiyama, Matsuyoshi; and Suzuki, Toshikazu, 4,323,197, Cl. 239-703.000.
Suzuki, Toshio, to Nippon Seiko Kabushiki Kaisha. Roller bearing having a forcible lubrication function. 4,323,289, Cl. 308-202.000.
Suzuki, Yukitomo; and Honda, Masakazu. Method for controlling position of a plurality of machining shafts each including a machine tool fitted thereto. 4,323,098, Cl. 144-2.00R.
Swan, Philip G., to Sigma Chemical Corporation. Method of inhibiting gravel pack and formation sandstone dissolution during steam injection. 4,323,124, Cl. 166-303.000.
Swanson, Billy L., to Phillips Petroleum Company. Gelled compositions and well treating. 4,323,123, Cl. 166-302.000.
Swedair AB: *See*—
Soderblom, Olof; and Karlsen, Lasse K., 4,323,993, Cl. 367-127.000.
Swenson, Donald A.: *See*—
Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., 4,323,857, Cl. 372-2.000.
Swenson, Richard M.: *See*—
Fowler, Steven E.; Hennings, George N.; Hibbs, Joseph E.; Redmond, Stephen L.; and Swenson, Richard M., 4,322,998, Cl. 89-1.50D.
Swin, Richard E., Sr.; and Atalla, Anwar A., to Tec-Air, Inc. Vaneless diffuser. 4,323,330, Cl. 415-207.000.
Sword, Alexander F. Line ender. 4,323,273, Cl. 294-78.00R.
Syeles, Albert M.: *See*—
Krall, Albert D.; McCorkle, John W.; Scarzello, John F.; and Syeles, Albert M., 4,323,900, Cl. 343-700.0MS.
Symmons, Edgar B.: *See*—
Tombaugh, Dennis; Martinsen, Nick; Symmons, Edgar B.; and Heinz, Lothar, 4,323,780, Cl. 250-419.000.
Syntex (U.S.A.) Inc.: *See*—
Fried, John H.; Kertesz, Denis J.; and Marx, Michael, 4,323,564, Cl. 424-241.000.
Fu, Cherng-Chyi, 4,323,467, Cl. 252-106.000.
Sytsma, Peter H.: *See*—
Ragan, Marshall P.; and Sytsma, Peter H., 4,323,141, Cl. 187-8.470.
Syva Company: *See*—
Leung, Danton K.; and Singh, Prithipal, 4,323,507, Cl. 260-345.90R.
Szablewski, Fred. C.: *See*—
Apter, Robert; Philippi, John; Potichko, Nicholas; and Szablewski, Fred. C., 4,323,333, Cl. 417-63.000.
Szabo, William. Body exercising weight apparatus. 4,323,236, Cl. 272-117.000.
Tachikawa, Kyoji; and Sekine, Hisashi, to National Research Institute for Metals. Method for producing superconducting Nb_3Sn wires. 4,323,402, Cl. 148-133.000.
Tachikawa Spring Co., Ltd.: *See*—
Urai, Muneharu, 4,323,410, Cl. 156-228.000.
Taco Bell: *See*—
Sartain, John R., 4,323,176, Cl. 222-326.000.
Takada, Juichiro. Belt clamps for vehicle passenger restraint belts. 4,323,204, Cl. 242-107.200.
Takada, Juichiro. Passive vehicle seat belt system. 4,323,267, Cl. 280-803.000.
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, to Shin-Etsu Chemical Company Limited. Method for the preparation of silicone-modified polyoxyalkylene polyethers and room temperature-curable compositions therewith. 4,323,488, Cl. 528-32.000.
Takahashi, Hiroshi: *See*—
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; and Tanahashi, Toshio, 4,323,038, Cl. 123-188.00M.
Takahashi, Masatoshi; Kotera, Norio; Uegaki, Masatoshi; Miyaoka, Takashi; and Maegawa, Yuzo, to Sumitomo Chemical Company Limited. Purification of compounds having high melting point. 4,323,431, Cl. 203-72.000.
Takahashi, Minoru: *See*—
Suzuki, Seikou; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Hachino, Hiroaki; and Takahashi, Minoru, 4,322,980, Cl. 73-727.000.
Takamatsu, Shinichi: *See*—
Mori, Hazime; Kohyama, Katsuhisa; Nakamura, Katsuhiko; and Takamatsu, Shinichi, 4,323,519, Cl. 528-499.000.
Takami, Akio; Matsuura, Toshitaka; and Saito, Tsutomu, to NGK Spark Plug Co., Ltd. Temperature compensated plug-in type oxygen detector for exhaust gas. 4,322,968, Cl. 73-27.00R.
Takami, Toru; Takezawa, Misako; Ohashi, Hiroyuki; and Takeda, Shigeru, to Ajinomoto Co., Inc. Fat emulsion for intravenous injection. 4,323,563, Cl. 424-199.000.
Takasaki, Yukio: *See*—
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.
Takasawa, Yoshio: *See*—
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.
Takase, Tadayoshi; and Kanaya, Yoshihiro, to Rinnai Kabushiki Kaisha. Safety apparatus for microwave cooking devices. 4,323,747, Cl. 219-10.55C.
Takeda Chemical Industries, Ltd.: *See*—
Tsushima, Susumu; Sendai, Michiyuki; and Shiraishi, Mitsuru, 4,323,676, Cl. 544-22.000.
Takeda, Shigeru: *See*—
Takami, Toru; Takezawa, Misako; Ohashi, Hiroyuki; and Takeda, Shigeru, 4,323,563, Cl. 424-199.000.
Takezawa, Misako: *See*—
Takami, Toru; Takezawa, Misako; Ohashi, Hiroyuki; and Takeda, Shigeru, 4,323,563, Cl. 424-199.000.
Talke, Frank E.: *See*—
Lee, Francis C.; Mills, Ross N.; and Talke, Frank E., 4,323,908, Cl. 346-140.00R.
Tanahashi, Toshio: *See*—
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; and Tanahashi, Toshio, 4,323,038, Cl. 123-188.00M.
Tanaka, Katsuto: *See*—
Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, 4,323,598, Cl. 427-160.000.
Tanaka, Nobuo: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Iwase, Kozi; Kubotera, Haruo; Kurihara, Takao; and Tanaka, Nobuo, 4,323,403, Cl. 148-134.000.
Tanaka, Shinichi: *See*—
Hattori, Masumi; Ishida, Toru; and Tanaka, Shinichi, 4,323,484, Cl. 252-521.000.
Tanaka, Yasuhiro; and Kakehi, Sasuga, to Murata Manufacturing Co., Ltd. Ladder-type piezoelectric filter. 4,323,865, Cl. 333-187.000.
Tanaka, Yoshinobu; Ogawa, Koichi; and Hioka, Minoru, to Kuraray Co., Ltd. Compact type fluid treatment apparatus. 4,323,455, Cl. 210-321.200.
Tanger, Charles M., to Rohm and Haas Company. Process for preparing phenoxybenzoic acids. 4,323,692, Cl. 560-65.000.
Taniguchi, Tomio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Structure for mounting a striker on a vehicle body. 4,323,271, Cl. 292-341.180.
Tannetics, Inc.: *See*—
Whorton, Robert B., III; Crosby, Samuel C., Jr.; Iannelli, Frank M.; Denmark, James; and Jeans, Edward L., 4,323,171, Cl. 222-82.000.
Tanrikut, Ibrahim S.: *See*—
Peterson, Steven C.; Stevens, Leonard W.; and Tanrikut, Ibrahim S., 4,322,945, Cl. 60-39.320.
Tanzawa, Kazuhiko; Iwado, Seigo; Tsujita, Yoshio; Kuroda, Masao; and Furuya, Kouhei, to Sankyo Company Limited. Preparation of Monacolin K. 4,323,648, Cl. 435-125.000.
Tarcsay, Lajos: *See*—
Baschang, Gerhard; Tarcsay, Lajos; Hartmann, Albert; and Stanek, Jaroslav, 4,323,560, Cl. 424-177.000.
Tasar, Omur: *See*—
Whiteside, Arliss E.; Freedman, Morris D.; Tasar, Omur; and Rothschild, Alexander M., 4,323,966, Cl. 364-200.000.
Tasho, Masao: *See*—
Hira, Kazumi; and Tasho, Masao, 4,323,276, Cl. 296-214.000.
Tavel, Donald L. Music synthesizer. 4,322,995, Cl. 84-1.190.
Taylor, Alfred J.: *See*—
Lumby, Roland J.; North, Bernard; Taylor, Alfred J.; and Thomas, Roland M., 4,323,323, Cl. 407-119.000.
Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Method of making piezoelectric polymeric acoustic transducer. 4,322,877, Cl. 29-25.350.
Taylor, Forrest C.: *See*—
Domes, E. A.; Taylor, Forrest C.; Vacval, Dusan M.; and Venere, Lawrence A., 4,323,279, Cl. 298-23.0DF.
TDK Electronics Co., Ltd.: *See*—
Mikame, Yoshio, 4,323,844, Cl. 324-212.000.
Okuyama, Kiyotaka; and Hosaka, Akihiko, 4,323,628, Cl. 428-425.900.
Umeki, Shinji, 4,323,464, Cl. 252-62.590.
Tea, Frank C. Vertical baling machine for waste material. 4,323,008, Cl. 100-214.000.
Tec-Air, Inc.: *See*—
Swin, Richard E., Sr.; and Atalla, Anwar A., 4,323,330, Cl. 415-207.000.
Tecumseh Products Company: *See*—
Rasmussen, Jerome L., 4,323,522, Cl. 261-72.00R.
Teich, Rudor M., to Foxmar Industries Inc. Emergency lighting system. 4,323,820, Cl. 315-86.000.
Teijin Limited: *See*—
Suzuki, Hideaki; and Yamashita, Gentaro, 4,323,486, Cl. 525-54.100.
Teledyne Hanau, a division of Teledyne, Inc.: *See*—
Beu, Richard A., 4,323,346, Cl. 433-58.000.
Televault, Inc.: *See*—
Flax, Louis; and Brzezinski, Vincent, 4,323,739, Cl. 179-189.00D.

Temes, Clifford L., to United States of America, Navy. Fragment-tolerant transmission line. 4,323,867, Cl. 333-239.000.
Temple University of the Commonwealth System of Higher Education: *See*—
Nowotny, Alois H., 4,323,561, Cl. 424-180.000.
Ten-Tec, Inc.: *See*—
Jones, Lee J., 4,323,960, Cl. 363-48.000.
Tenneco Chemicals, Inc.: *See*—
Dowthwaite, Edwin; and Hiskens, Ian R., 4,323,425, Cl. 162-168.00N.
Tentarelli, Joseph A.; Wahlers, Richard L.; and Woods, John G., to TRW, Inc. Method of making temperature sensitive device and device made thereby. 4,323,875, Cl. 338-25.000.
Terada, Katumi; and Nemoto, Kazuyuki, to Olympus Optical Co. Ltd. Apparatus for use with a motor drive. 4,323,828, Cl. 318-45.000.
Terashima, Akira: *See*—
Yoshizawa, Naomi; and Terashima, Akira, 4,323,999, Cl. 369-19.000.
Ternstrom, Ingela M.; and Boman, Lars E., to Molnlycke AB. Disposable diaper. 4,323,070, Cl. 128-287.000.
Terpening, George L., to Acro Matic, Inc. Exercising method. 4,323,232, Cl. 272-68.000.
Texaco Inc.: *See*—
Morduchowitz, Abraham, 4,323,463, Cl. 252-8.55D.
Parrack, Alvin L.; and Lunsford, Delbert R., 4,323,876, Cl. 367-40.000.
Speranza, George P.; and Zimmerman, Robert L., 4,323,658, Cl. 521-174.000.
Texas Instruments Incorporated: *See*—
Lam, Hon W., 4,323,417, Cl. 156-613.000.
Wiggins, Richard H.; and Henderson, Alva E., 4,323,732, Cl. 179-1.0SM.
Theilen, Gordon H., to University of California, The Regents of the. Method of protecting cattle and sheep against bovine leukemia virus and vaccines for use therein. 4,323,555, Cl. 424-88.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track working machine. 4,323,013, Cl. 104-7.00B.
Thibault, Louis R.: *See*—
Adams, Arthur C.; Alexander, Frank B., Jr.; Levinstein, Hyman J.; and Thibault, Louis R., 4,323,638, Cl. 430-275.000.
Thillet, Georges: *See*—
Denoor, Gaston; and Thillet, Georges, 4,323,200, Cl. 242-7.210.
Thomas, Glen H.: *See*—
Sisson, Edwin D.; Stoutenburg, Donn V.; and Thomas, Glen H., 4,322,976, Cl. 73-659.000.
Thomas, Roland M.: *See*—
Lumby, Roland J.; North, Bernard; Taylor, Alfred J.; and Thomas, Roland M., 4,323,323, Cl. 407-119.000.
Thome, Heinrich: *See*—
Buhring, Otto; Dreessen, Gerardus J. W.; Groeneveld, Jacob W. H.; Queck, Robert; Thome, Heinrich; and Willemsen, Gerrit J., 4,323,718, Cl. 373-73.000.
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Collignon, Claude, to Societe d'Etudes Scientifiques et Industrielles de L'ile-de-France. Substituted 2,3-alkylene di (oxy) benzamides and derivatives. 4,323,503, Cl. 260-340.300.
Thompson, Elmer R., to Datho Mfg. Inc. Apparatus for overcoming sewing machine needle bind. 4,323,020, Cl. 112-61.000.
Thompson, Herbert E., to Xerox Corporation. Rolling pivot for magnetic head. 4,323,938, Cl. 360-105.000.
Thompson, Roger A. Counter-rotating vortices generator for an aircraft wing. 4,323,209, Cl. 244-199.000.
Thomson-CSF: *See*—
Berger, Jean L.; and Coutures, Jean L., 4,323,791, Cl. 307-221.00D.
Maerfeld, Charles; and Gautier, Herve, 4,323,985, Cl. 365-157.000.
Valdmann, Henri, 4,323,909, Cl. 357-13.000.
Thun, Gerhard: *See*—
Muller, Stefan; Thun, Gerhard; and Glauner, Wolfgang, 4,322,982, Cl. 73-861.220.
Tick, Paul A.; and Sanford, Leon M., deceased (by Sanford, Michele R., administratrix), to Corning Glass Works. Moldable glass compositions. 4,323,654, Cl. 501-47.000.
Tiegs, Sue M.: *See*—
Turner, Lloyd J.; Willey, Melvin G.; Tiegs, Sue M.; and Van Cleve, John E., Jr., 4,323,198, Cl. 241-5.000.
Tilson, Bernard A.: *See*—
Ott, Henry W.; and Tilson, Bernard A., 4,323,733, Cl. 179-6.30R.
Timex Corporation: *See*—
Sethofer, Nicholas L., 4,323,471, Cl. 252-299.610.
Sethofer, Nicholas L., 4,323,472, Cl. 252-299.610.
Sethofer, Nicholas L., 4,323,473, Cl. 252-299.610.
Sethofer, Nicholas L., 4,323,504, Cl. 260-340.700.
Tobin, Leo W., Jr. Depth sounder repeater structure and method. 4,323,992, Cl. 367-108.000.
Toho Aen Kabushiki Kaisha: *See*—
Honda, Tsuneo; Nishina, Haruo; and Uehara, Shuichi, 4,323,391, Cl. 75-14.000.
Tohyama, Shigeo: *See*—
Akitomo, Nobuo; and Tohyama, Shigeo, 4,323,309, Cl. 356-319.000.
Tohyama, Yoshikuni: *See*—
Kitajima, Tadayuki; and Tohyama, Yoshikuni, 4,323,308, Cl. 355-57.000.
Tokyo Eizai Laboratory Co., Ltd.: *See*—
Usukura, Koji, 4,323,061, Cl. 128-90.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Akashi, Kazuo, 4,323,891, Cl. 340-709.000.
Ikeda, Yoshio, 4,323,170, Cl. 222-70.000.
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,322,952, Cl. 62-198.000.
Nakamura, Norimitsu, 4,323,981, Cl. 364-749.000.
Tombaugh, Dennis; Martinsen, Nick; Symmons, Edgar B.; and Heinz, Lothar, to Siemens Medical Laboratories, Inc. Target assembly for a linear accelerator. 4,323,780, Cl. 250-419.000.
Tomic, Milorad: *See*—
Sesterhenn, Lothar; and Tomic, Milorad, 4,323,438, Cl. 204-128.000.
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, to Yamaha Hatsudoki Kabushiki Kaisha. Structure for supporting a motorcycle engine. 4,323,135, Cl. 180-228.000.
Tomita, Tadashi: *See*—
Sato, Tadashi; Hara, Toyoji; and Tomita, Tadashi, 4,323,787, Cl. 307-38.000.
Tone, Masatsugu: *See*—
Bando, Niro; Miyata, Junji; Tone, Masatsugu; and Watanabe, Haruo, 4,323,137, Cl. 180-305.000.
Tonnesen, Ole: *See*—
Moritz, Bertil; and Tonnesen, Ole, 4,323,870, Cl. 336-206.000.
Topfl, Rosemarie, to Ciba-Geigy Corporation. Mixtures of components, comprising epoxide/polyalkylene-polyaminoamide reaction products and acrylic-based and/or styrene-based polymers, their preparation and their use as paper sizes and textile treatment agents. 4,323,490, Cl. 523-409.000.
Toppy's Salons Limited: *See*—
Macaulay, John G., 4,323,212, Cl. 248-51.000.
Toray Industries, Inc.: *See*—
Chiba, Kazumasa; Egawa, Keiichi; and Muraki, Toshio, 4,323,639, Cl. 430-281.000.
Torrington Company, The: *See*—
Stella, Leo; and Marola, America E., 4,323,287, Cl. 308-187.100.
Totten, David S.: *See*—
Stikeleather, Larry F.; and Totten, David S., 4,323,126, Cl. 172-147.000.
Touyama, Tasuku: *See*—
Schaer, Glenn R.; Touyama, Tasuku; Yamamoto, Teruaki; Honda, Keisuke; and Wada, Tatsuo, 4,323,441, Cl. 204-224.00R.
Townsend Engineering Company: *See*—
Townsend, Ray T.; and Ladd, Floyd R., 4,322,871, Cl. 17-1.00F.
Townsend, Ray T.; and Ladd, Floyd R., to Townsend Engineering Company. Link cutter. 4,322,871, Cl. 17-1.00F.
Toyama, Teruhiko: *See*—
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.
Toyoda, Shuhei: *See*—
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; and Tanahashi, Toshio, 4,323,038, Cl. 123-188.00M.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Akatsuka, Takao, 4,323,440, Cl. 204-195.00S.
Kondo, Katsumi; Huwa, Yoshio; and Miyazaki, Syouzi, 4,323,257, Cl. 277-224.000.
Morishita, Teru; Sugiyama, Matsuyoshi; and Suzuki, Toshikazu, 4,323,197, Cl. 239-703.000.
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; and Tanahashi, Toshio, 4,323,038, Cl. 123-188.00M.
Taniguchi, Tomio, 4,323,271, Cl. 292-341.180.
Traux, Robert L. Apparatus for reducing electrostatic charge storage and EMI on dielectric surfaces. 4,323,946, Cl. 361-218.000.
Trempe, Michel. Apparatus for making truck bodies, unitized shells and panels. 4,323,413, Cl. 156-382.000.
Trinh, Toan: *See*—
Compton, Donald B.; Lewis, William P.; and Trinh, Toan, 4,323,193, Cl. 239-44.000.
Triple Dee Electronics Inc.: *See*—
Karbowski, James P., 4,323,847, Cl. 324-327.000.
Troitsky, Andrian P.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.
Troponwerke GmbH & Co. KG: *See*—
Opitz, Wolfgang; Etscherberg, Eugen; Dell, Hans-Dieter; and Jacobi, Haireddin, 4,323,517, Cl. 260-455.00R.
Troyer, LeRoy S. Underground air tempering system. 4,323,113, Cl. 165-45.000.
TRW Inc.: *See*—
Murch, Charles K.; and Hunter, Charles R., 4,322,946, Cl. 60-203.100.
Tentarelli, Joseph A.; Wahlers, Richard L.; and Woods, John G., 4,323,875, Cl. 338-25.000.
Tsai, Shirley C.; and McIlvried, Howard G., III, to Gulf Research & Development Company. Coal Liquefaction process employing octahydrophenanthrene-enriched solvent. 4,323,447, Cl. 208-8.0LE.
Tsuboi, Hikotada: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,323,662, Cl. 525-281.000.

Tsuchiya, Katsuhiro: *See*—
Sawada, Susumu; Fukuda, Takashi; Tsuchiya, Katsuhiro; and Ito, Kazuo, 4,323,404, Cl. 148-148.000.
Tsuchiya, Yukio: *See*—
Shimada, Kunihiko; and Tsuchiya, Yukio, 4,323,737, Cl. 179-115.50R.
Tsuge, Noboru; Kuwakado, Satosi; and Shimogawa, Toshiaki, to Nippon Soken, Inc. Safety seat-belt retractor. 4,323,205, Cl. 242-107.40A.
Tsugekawa, Takanori; Banba, Tosio; and Matsui, Masakuni, to Yanmar Diesel Engine Co., Ltd. Antechamber system diesel engine. 4,323,039, Cl. 123-275.000.
Tsujita, Yoshio: *See*—
Tanzawa, Kazuhiko; Iwado, Seigo; Tsujita, Yoshio; Kuroda, Masao; and Furuya, Kouhei, 4,323,648, Cl. 435-125.000.
Tsukada, Toshihisa: *See*—
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.
Tsumura, Haruhide: *See*—
Nichimoto, Susumu; Shinoda, Isao; Nakamura, Shigeo; and Tsumura, Haruhide, 4,323,148, Cl. 194-100.00A.
Tsunashima, Eiichi, to Matsushita Electric Industrial Co., Ltd. Method of printing a spot pattern in a printed circuit board. 4,323,593, Cl. 427-97.000.
Tsushima, Susumu; Sendai, Michiyuki; and Shiraishi, Mitsuru, to Takeda Chemical Industries, Ltd. Process for preparing cephalosporins. 4,323,676, Cl. 544-22.000.
Tsutsumi, Masato: *See*—
Nakagawa, Noboru; Oonishi, Toshiyuki; Tsutsumi, Masato; and Kawamoto, Akira, 4,322,952, Cl. 62-198.000.
Tulchinsky, Eduard A.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.
Turcsan, Istvan: *See*—
Lugosi, Gyorgy; May, Antal S.; Bodnar, Janos; Turcsan, Istvan; Jelinek, Istvan; Somfai, Eva; and Simandi, Laszlo, 4,323,469, Cl. 252-182.000.
Turek, James A., to Panduit Corp. Connector fixture. 4,323,227, Cl. 269-254.00R.
Turner, Lloyd J.; Willey, Melvin G.; Tiegs, Sue M.; and Van Cleve, John E., Jr., to United States of America, Energy. Method for fracturing silicon-carbide coatings on nuclear-fuel particles. 4,323,198, Cl. 241-5.000.
Turner, Paul N.: *See*—
Jenkins, Carl B., Jr.; Porenski, Harry S., Jr.; and Turner, Paul N., 4,323,084, Cl. 131-319.000.
Ube Industries, Ltd.: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.
Nishimura, Hiroshi; Monma, Tetsuo; Yoshida, Minoru; Kirimoto, Kazunari; Hayamizu, Yoshio; and Nagasawa, Toshio, 4,323,607, Cl. 219-213.000.
Uchida, Shinya, to Laurel Bank Machine Co., Ltd. Apparatus for counting sheets and discriminating different kinds thereof. 4,323,768, Cl. 235-92.0SB.
Uchiyama, Haruo: *See*—
Kawamura, Naoto; Masegi, Koichi; Hakamada, Isao; Uchiyama, Haruo; Kitamura, Takashi; and Ishii, Masaaki, 4,323,297, Cl. 350-6.800.
Uchiyama, Kenji: *See*—
Sakata, Kenji; Yamada, Toshiaki; Uchiyama, Kenji; and Hasegawa, Yugo, 4,323,600, Cl. 427-202.000.
Uchiyama, Sadao: *See*—
Koizumi, Satoru; Shimamura, Takashi; and Uchiyama, Sadao, 4,323,935, Cl. 360-73.000.
Ueda Giken Co., Ltd.: *See*—
Ueda, Minoru, 4,322,917, Cl. 51-123.00R.
Ueda, Minoru, to Ueda Giken Co., Ltd. Double-head automatic grinding machine. 4,322,917, Cl. 51-123.00R.
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, to Sato Technical Research Laboratory Ltd.; and Itoh Metal Abrasive Co., Ltd. Process and apparatus for producing spherical particles and fibers with a specially fixed size from melts. 4,323,523, Cl. 264-8.000.
Uegaki, Masatoshi: *See*—
Takahashi, Masatoshi; Kotera, Norio; Uegaki, Masatoshi; Miyaoka, Takashi; and Maegawa, Yuzo, 4,323,431, Cl. 203-72.000.
Uehara, Shuichi: *See*—
Honda, Tsuneo; Nishina, Haruo; and Uehara, Shuichi, 4,323,391, Cl. 75-14.000.
Uejima, Hiroyuki; Hirai, Masahide; and Sakaida, Tsutomu, to Unitika Ltd. Process for removing heavy-metal ions from aqueous solution. 4,323,458, Cl. 210-688.000.
Ueno, Hajime: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,323,135, Cl. 180-228.000.
Uhlig, Albert R., to Owens-Illinois, Inc. Apparatus for making plastic articles. 4,323,340, Cl. 425-325.000.
Uhlig, Albert R., to Owens-Illinois, Inc. Method for applying prefabricated parts to blow molded articles. 4,323,411, Cl. 156-245.000.
Umeki, Shinji, to TDK Electronics Co., Ltd. Process for producing hydrated iron oxide having silicon and phosphorus component. 4,323,464, Cl. 252-62.590.
Union Carbide Corporation: *See*—
Ashworth, Robert W.; and Fu, Wallace Y., 4,323,516, Cl. 260-453.300.
Dombek, Bernard D., 4,323,513, Cl. 260-410.600.
Madden, Thomas H.; and Reash, Clair W., 4,323,818, Cl. 313-481.000.
McCullough, Robert W.; and Hewett, Thomas A., 4,323,053, Cl. 126-441.000.
Union Metal Manufacturing Company: *See*—
Garchinsky, John S., 4,323,028, Cl. 116-285.000.
Unisearch Limited: *See*—
Green, Martin A., 4,323,719, Cl. 136-249.000.
Unisplay S.A.: *See*—
Salam, Hassan P. A., 4,323,889, Cl. 340-373.000.
United Kingdom Atomic Energy Authority: *See*—
Rosevear, Alan, 4,323,650, Cl. 435-174.000.
United States of America
Air Force: *See*—
Leiby, Clare C., Jr.; and Ezekiel, Shaoul, 4,323,860, Cl. 372-32.000.
O'Connell, Robert M., 4,323,809, Cl. 310-313.00A.
Shaw, Herbert J.; and Chodorow, Marvin, 4,323,310, Cl. 356-350.000.
Shedd, Walter M.; and LaPierre, Donald C., 4,323,851, Cl. 328-72.000.
Watkins, Grant H., 4,323,798, Cl. 307-491.000.
Army: *See*—
Gerlach, Horst W. A., 4,323,855, Cl. 331-56.000.
Golabek, Robert S., 4,322,966, Cl. 73-7.000.
Holmes, Allen B.; Gehman, Stacy E.; and Funke, Maurice F., 4,323,991, Cl. 367-83.000.
McGarrity, James M.; and Boesch, Harold E., Jr., 4,323,842, Cl. 324-158.00R.
Energy: *See*—
Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., 4,323,857, Cl. 372-2.000.
Lampe, Robert F., 4,322,880, Cl. 29-452.000.
Masnari, Nino A.; Rensel, Walter B.; Robinson, Merrill G.; Solomon, David E.; Wise, Kensall D.; and Wuttke, Gilbert H., 4,323,420, Cl. 156-628.000.
Turner, Lloyd J.; Willey, Melvin G.; Tiegs, Sue M.; and Van Cleve, John E., Jr., 4,323,198, Cl. 241-5.000.
Winkelman, Paul F., 4,323,722, Cl. 174-43.000.
Navy: *See*—
Bond, Clarence D., 4,323,641, Cl. 430-370.000.
Creighton, Robert A.; and Engel, Stephen M., 4,323,897, Cl. 343-18.00E.
Dennis, Dwight L.; and Mannschreck, William A., 4,323,000, Cl. 89-36.00A.
Fisher, Seth G.; and Kowalyshyn, Stephen, 4,323,025, Cl. 114-25.000.
Fowler, Steven E.; Hennings, George N.; Hibbs, Joseph E.; Redmond, Stephen L.; and Swenson, Richard M., 4,322,998, Cl. 89-1.50D.
Gilligan, William H., 4,323,518, Cl. 260-455.00B.
Krall, Albert D.; McCorkle, John W.; Scarzello, John F.; and Syeles, Albert M., 4,323,900, Cl. 343-700.0MS.
Lucas, Bruce T., 4,323,880, Cl. 340-146.3AC.
Seitel, Steven C.; Porteus, James O.; and Faith, William N., 4,322,967, Cl. 73-15.600.
Temes, Clifford L., 4,323,867, Cl. 333-239.000.
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.
U.S. Philips Corporation: *See*—
Baudry, Hugues; Morhaim, Claude; and Bricout, Dominique, 4,323,652, Cl. 501-17.000.
Beitler, Franz; and Neckamm, Harald, 4,323,936, Cl. 360-85.000.
Boudault, Robert; and Pouzoullic, Gerard, 4,323,862, Cl. 332-9.00R.
Chiecchi, Cesare, 4,322,884, Cl. 29-602.00R.
Damen, Johannes P. M.; and Pistorius, Johannes A., 4,323,618, Cl. 428-212.000.
de Waard, Peter J., 4,323,856, Cl. 372-46.000.
Hoefert, Reimar, 4,323,978, Cl. 364-702.000.
Kinghorn, John R., 4,323,892, Cl. 340-724.000.
Vennix, Johannus A.; and Stapel, Cornelis, 4,323,817, Cl. 313-440.000.
United States Steel Corporation: *See*—
Glassman, Donald; and Maier, Edward E., 4,323,430, Cl. 203-7.000.
United Technologies Corporation: *See*—
Brown, Clyde O.; Breinan, Edward M.; and Kear, Bernard H., 4,323,756, Cl. 219-121.0LF.
Fradenburgh, Evan A., 4,323,332, Cl. 416-134.00A.
Paulis, George J.; and DeCarlo, Joseph D., 4,323,094, Cl. 137-68.00R.
Peterson, Steven C.; Stevens, Leonard W.; and Tanrikut, Ibrahim S., 4,322,945, Cl. 60-39.320.

Unitika Ltd.: *See—*
Uejima, Hiroyuki; Hirai, Masahide; and Sakaida, Tsutomu, 4,323,458, Cl. 210-688.000.

University of California, The Regents of the: *See—*
Demetrescu, Mihai C., 4,323,079, Cl. 128-731.000.
O'Farrell, Patrick H., 4,323,439, Cl. 204-180.00G.
Theilen, Gordon H., 4,323,555, Cl. 424-88.000.

University of Delaware: *See—*
Stiles, Alvin B.; and Schrader, Glenn L., Jr., 4,323,482, Cl. 252-462.000.

University of Iowa Research Foundation: *See—*
Walker, D. David, 4,323,852, Cl. 330-9.000.

University of Liverpool: *See—*
Bornat, Alan, 4,323,525, Cl. 264-24.000.

University of Miami: *See—*
Monji, Nobuo; and Castro, Albert, 4,323,647, Cl. 495-7.000.

University Patents Inc: *See—*
Crockford, David R.; and Rhodes, Buck A., 4,323,546, Cl. 424-1.000.

Uno, Koichi; and Murakami, Shinichi, to Narumi China Corporation. Casing having a layer for protecting a semiconductor memory to be sealed therein against alpha particles and a method of manufacturing same. 4,323,405, Cl. 156-64.000.

UOP Inc.: *See—*
Engel, Dusan J., 4,323,713, Cl. 568-766.000.
Engel, Dusan J.; and Malloy, Thomas P., 4,323,715, Cl. 568-766.000.
Imai, Tamotsu, 4,323,712, Cl. 568-697.000.
Joy, George C., III, 4,323,542, Cl. 423-213.500.
Kwong, Gary W. Y., 4,323,709, Cl. 564-476.000.
Malloy, Thomas P.; and Engel, Dusan J., 4,323,714, Cl. 568-766.000.

Upjohn Company, The: *See—*
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,672, Cl. 542-421.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,673, Cl. 542-426.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,323,674, Cl. 542-426.000.

Ura, Masaaki: *See—*
Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, 4,323,389, Cl. 71-124.000.

Urai, Muneharu, to Tachikawa Spring Co., Ltd. Method of manufacturing seat cushions. 4,323,410, Cl. 156-228.000.

Urick, Robert A.: *See—*
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.

USM Corporation: *See—*
Giebel, Gerhard, 4,322,863, Cl. 12-12.500.

USS Engineers and Consultants, Inc.: *See—*
Roberts, Michael A.; and Copperthwaite, Martin, 4,323,529, Cl. 264-69.000.

Usukura, Koji, to Tokyo Eizai Laboratory Co., Ltd. Stiff supporting bandage. 4,323,061, Cl. 128-90.000.

Utility Products, a division of Reliable Electric Co.: *See—*
Hickman, John S.; Olson, John B.; and Jeanson, Richard L., 4,323,290, Cl. 312-100.000.

Vachula, George M.: *See—*
Barnes, Richard M.; Vachula, George M.; and Bennett, Clarence L., Jr., 4,323,898, Cl. 343-5.0SA.
Barnes, Richard M.; and Vachula, George M., 4,323,899, Cl. 343-55.00A.

Vacval, Dusan M.: *See—*
Domes, E. A.; Taylor, Forrest C.; Vacval, Dusan M.; and Venere, Lawrence A., 4,323,279, Cl. 298-23.0DF.

Valcour Imprinted Papers, Inc.: *See—*
Collins, Frederick H., 4,323,528, Cl. 264-53.000.

Valdmann, Henri, to Thomson-CSF. Planar avalanche diode with a breakdown voltage between 4 and 8 volts. 4,323,909, Cl. 357-13.000.

Valmont Industries, Inc.: *See—*
Newbold, Don; and Sherwin, Owen W., 4,323,194, Cl. 239-177.000.

Valyi, Emery I. Apparatus for forming hollow plastic objects. 4,323,341, Cl. 425-526.000.

Van Cleve, John E., Jr.: *See—*
Turner, Lloyd J.; Willey, Melvin G.; Tiegs, Sue M.; and Van Cleve, John E., Jr., 4,323,198, Cl. 241-5.000.

van der Lely, Ary: *See—*
van der Lely, Cornelis; and van der Lely, Ary, 4,323,136, Cl. 180-271.000.

van der Lely, Cornelis; and van der Lely, Ary, to C. van der Lely N.V. Movement stopping safety device for agricultural machine. 4,323,136, Cl. 180-271.000.

van Dongeren, Jan P.: *See—*
de Kok, Johan; and van Dongeren, Jan P., 4,323,339, Cl. 425-199.000.

van Issum, Ernst J., to Monsanto Company. Carpets having pile of crimped and non-crimped nylon filaments. 4,323,612, Cl. 428-89.000.

Varma, Ravi K.; and Chao, Sam T., to E. R. Squibb & Sons, Inc. Steroid derivatives and their use in radioimmunoassays. 4,323,511, Cl. 260-397.450.

Vascor, Inc.: *See—*
Lentz, David J.; and Pollock, Elisabeth M., 4,323,358, Cl. 8-94.110.

Vasilos, Thomas: *See—*
Sellers, David J.; Rhodes, William H.; and Vasilos, Thomas, 4,323,545, Cl. 423-625.000.

Vayssie, Charles: *See—*
Bouillon, Claude; Vayssie, Charles; and Richard, Francoise, 4,323,549, Cl. 424-45.000.

Veaux, Jacques: *See—*
Masclet, Jean; and Veaux, Jacques, 4,323,001, Cl. 91-25.000.

Venere, Lawrence A.: *See—*
Domes, E. A.; Taylor, Forrest C.; Vacval, Dusan M.; and Venere, Lawrence A., 4,323,279, Cl. 298-23.0DF.

Vennix, Johannus A.; and Stapel, Cornelis, to U.S. Philips Corporation. Color display tube. 4,323,817, Cl. 313-440.000.

Verdier, Jean P.: *See—*
Durandeau, Michel; Voisin, Norbert; and Verdier, Jean P., 4,323,884, Cl. 340-347.0DA.

Veselovsky, Roman A.; Kuxin, Anatoly N.; Mudrov, Oleg A.; and Roitenberg, Yakov I. Polyurethane adhesive composition. 4,323,491, Cl. 524-144.000.

Victor United, Inc.: *See—*
Meyer, Leonard S., 4,323,415, Cl. 156-433.000.

Vieland, Leon J.; and Cannuli, Vincent M., to RCA Corporation. Spring-loaded resistive lens structure for electron gun. 4,323,813, Cl. 313-250.000.

Viitanen, Veikko K.: *See—*
Harper, Bruce M.; Billett, Ronald J.; Roberts, Thomas E.; and Viitanen, Veikko K., 4,323,336, Cl. 425-126.00S.

Vink, Walter; Spooner, Leonard; and Mackay, Donald A. M., to Life Savers, Inc. Aerated confections. 4,323,588, Cl. 426-564.000.

Visser, Harry: *See—*
Witney, Gary; and Visser, Harry, 4,323,829, Cl. 318-55.000.

Vissing, Soren: *See—*
Hansen, Niels H. V.; Mikkelsen, Erling H.; and Vissing, Soren, 4,323,474, Cl. 252-307.000.

VLSI Technology Research Association: *See—*
Enomoto, Tatsuya; and Shibata, Hiroshi, 4,322,881, Cl. 29-571.000.

Voest-Alpine AG: *See—*
Staudinger, Gernot, 4,323,366, Cl. 48-73.000.

Vogel, Hans-Henning; Strickler, Rainer; Oppenlaender, Knut; and Baur, Richard, to BASF Aktiengesellschaft. 2-Hydroxypropylimidazoles, their preparation, and their use as oil-soluble corrosion inhibitors. 4,323,689, Cl. 548-336.000.

Vohr, John H., to General Electric Co. Thrust bearing cooling apparatus. 4,323,286, Cl. 308-160.000.

Voigt, John E. Article crushing device. 4,323,009, Cl. 100-240.000.

Voisin, Norbert: *See—*
Durandeau, Michel; Voisin, Norbert; and Verdier, Jean P., 4,323,884, Cl. 340-347.0DA.

Vokurka, Franz, to IGM-Industriegerate und Maschinenfabriks-Gesellschaft mbH. Universal control structure for welding devices of an automatic welding machine. 4,323,758, Cl. 219-125.100.

Volkswagenwerk Aktiengesellschaft: *See—*
Emmenthal, Klaus-Dieter; and Hagemann, Gunter, 4,322,948, Cl. 60-602.000.
Sukopp, Wolfgang; Schmidt, Holger; and Schwanz, Wilfried, 4,323,278, Cl. 297-481.000.

von Meyer, Robert F. Pneumatic sponge mop. 4,322,865, Cl. 15-119.00A.

Vora, Madhukar D., to Fairchild Camera & Instrument Corp. Method for making an integrated injection logic structure including a self-aligned base contact. 4,322,882, Cl. 29-571.000.

Voss, Gunther; and Gruber, Peter, to Boehringer Ingelheim GmbH. Method of lubricating compression tools of molding machines. 4,323,530, Cl. 264-109.000.

Vosyka, Josef; and Skoda, Jiri, to Vyzkumny ustav zivocisne vyroby Uhrineves. Mobile arrangement for a group stabling and handling of farm animals. 4,323,033, Cl. 119-14.040.

Vyzkumny ustav bavlnarsky: *See—*
Fajt, Ludvik; Didek, Stanislav; Kasparek, Jaromir; Storek, Jaroslav; Andres, Jiri; Borovcova, Zelmira; Markova, Marie; Reymanova, Marketa; and Stepanek, Miroslav, 4,322,942, Cl. 57-411.000.

Vyzkumny ustav zivocisne vyroby Uhrineves: *See—*
Vosyka, Josef; and Skoda, Jiri, 4,323,033, Cl. 119-14.040.

W. Schlafhorst & Co.: *See—*
Rohner, Joachim; and Zumfeld, Heinz, 4,322,943, Cl. 57-261.000.

Wada, Tatsuo: *See—*
Schaer, Glenn R.; Touyama, Tasuku; Yamamoto, Teruaki; Honda, Keisuke; and Wada, Tatsuo, 4,323,441, Cl. 204-224.00R.

Wagner, Kuuno: *See—*
Mazanek, Jan; Gipp, Roland; Zollner, Robert; Seifert, Peter; Wagner, Kuuno; and Blahak, Johannes, 4,323,657, Cl. 521-116.000.

Wahlers, Richard L.: *See—*
Tentarelli, Joseph A.; Wahlers, Richard L.; and Woods, John G., 4,323,875, Cl. 338-25.000.

Wake, Malcolm, to Fletcher Sutcliffe Wild Limited. Hydraulic equipment. 4,323,002, Cl. 91-25.000.

Wakefield, G. Felix, to Atlantic Richfield Company. Method for ribbon solar cell fabrication. 4,323,419, Cl. 156-622.000.

Waksmunski, Raymond A.: *See—*
Gintert, Dean W.; and Waksmunski, Raymond A., 4,323,385, Cl. 65-351.000.

Walker, D. David, to University of Iowa Research Foundation. Fast recovery electrode amplifier. 4,323,852, Cl. 330-9.000.

Walker, Derek: *See—*
Aston, William C.; and Walker, Derek, 4,323,535, Cl. 264-528.000.

Walker, Herbert C.: *See—*
Lewis, Norris E.; and Walker, Herbert C., 4,323,292, Cl. 339-5.00M.

Walkowiak, Michael: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; and Walkowiak, Michael, 4,323,348, Cl. 433-228.000.

Wallshein, Melvin. Orthodontic biassing device with screw disengagement preventing means. 4,323,345, Cl. 433-7.000.

Walsh, Michael D., III. Vehicle hoisting tow trailer. 4,323,328, Cl. 414-563.000.

Wangard, William; and Starkey, David, to Norlin Industries, Inc. Alternating repeat keying signal generator. 4,322,996, Cl. 84-1.240.

Warchol, Henry A. Bearing components and method of making same. 4,322,878, Cl. 29-148.40C.

Warchol, Henry A. Bearing components and methods of making same. 4,322,879, Cl. 29-148.40C.

Ward, Robert E.: *See—*
Kincaid, John W.; and Ward, Robert E., 4,323,721, Cl. 174-36.000.

Wardle, Edmund: *See—*
Ball, Frank C.; and Wardle, Edmund, 4,322,969, Cl. 73-40.50R.

Warren, William; and Spector, George. Cerf cycle. 4,323,352, Cl. 440-27.000.

Watanabe, Haruo: *See—*
Bando, Niro; Miyata, Junji; Tone, Masatsugu; and Watanabe, Haruo, 4,323,137, Cl. 180-305.000.

Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, to Janome Sewing Machine Co., Ltd. Sewing machine drive motor control system. 4,323,833, Cl. 318-376.000.

Watanabe, Masanao; Naito, Keiichi; Odajima, Tooru; and Fujiwara, Yoshio, to Sony Corporation. Non-flammable adhesive compositions. 4,323,659, Cl. 525-108.000.

Watkins, Grant H., to United States of America, Air Force. Fast operating switchable operational amplifier driven circuits. 4,323,798, Cl. 307-491.000.

Wavin B.V.: *See—*
de Kok, Johan; and van Dongeren, Jan P., 4,323,339, Cl. 425-199.000.

Wavre, Alain: *See—*
Mazond, Michel P.; and Wavre, Alain, 4,323,749, Cl. 219-69.00M.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Rengstl, Johann; and Lutz, Alfons, 4,323,277, Cl. 296-216.000.

Weber, Helmut: *See—*
Reitberger, Peter H.; and Weber, Helmut, 4,323,905, Cl. 346-75.000.

Weber, Robert J., to Rockwell International Corporation. N-Way power divider/combiner. 4,323,863, Cl. 333-109.000.

Weeks, Paul D.: *See—*
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,323,506, Cl. 260-345.80R.

Weghaupt, Erich; and D'ham, Reinhold, to Kraftwerk Union Aktiengesellschaft. Bearing system for a rotor of electric machines, especially for a rotor of a turbogenerator with a superconductive field winding. 4,323,801, Cl. 310-52.000.

Weick, Heinz H., to Herkules AG. Bottle closure. 4,323,165, Cl. 215-320.000.

Weigh-Tronix, Inc.: *See—*
Bradley, Richard S., 4,323,132, Cl. 177-139.000.

Weinlich, Jurgen: *See—*
Kraus, Helmut; Weinlich, Jurgen; and Plewan, Otto, 4,323,661, Cl. 525-259.000.

Weinreich, Stephen D.: *See—*
Berman, Joel; and Weinreich, Stephen D., 4,323,105, Cl. 160-309.000.

Weis, Siegfried K.: *See—*
Smith, Harvey E., Sr.; and Weis, Siegfried K., 4,323,288, Cl. 308-196.000.

Weissman, Bernard, to IPCO Corporation. Dental tool for use with dental retaining splints. 4,323,347, Cl. 433-141.000.

Weisz, William: *See—*
Jones, Gary D.; Laidig, Manfred R.; and Weisz, William, 4,323,024, Cl. 112-237.000.

Welch, Cletus N.; and Snodgrass, John O., to PPG Industries, Inc. Nickel-molybdenum cathode. 4,323,595, Cl. 427-123.000.

Welding Institute, The: *See—*
Edson, Donald A.; Johnson, Keith I.; and Scott, Michael H., 4,323,759, Cl. 219-137.0PS.

Wells, Raymond E. Rotary floor conditioning machine attachment. 4,322,920, Cl. 51-168.000.

Wendling, Larry A.; and Covington, John B., to Minnesota Mining and Manufacturing Company. Irradiation of polyacrylate films in air. 4,323,591, Cl. 427-53.100.

Wessling, Ritchie A.: *See—*
Bradley, Norbert L.; Cleereman, Kenneth J.; and Wessling, Ritchie A., 4,323,531, Cl. 264-113.000.

West, Patricia A.: *See—*
West, Robert N.; West, Patricia A.; Barker, Andrew J.; and Hall, Rosemary J., 4,323,311, Cl. 356-431.000.

West, Robert N.; West, Patricia A.; Barker, Andrew J.; and Hall, Rosemary J., to Sira Institute Limited. Apparatus and method for detecting holes in sheet material. 4,323,311, Cl. 356-431.000.

Westermayer, Joerg, to Siemens Aktiengesellschaft. Circuit arrangement for the control of a crypto operation in the case of procedure-controlled semi-duplex data transmission systems. 4,323,729, Cl. 178-22.010.

Western Electric Company, Incorporated: *See—*
Davis, Dwight M., Jr., 4,323,295, Cl. 339-107.000.

Westinghouse Electric Corp.: *See—*
Boggavarapu, Rao L., 4,323,823, Cl. 315-254.000.
Mercier, George E.; Pickett, John H.; and Holtzman, Barry L., 4,323,948, Cl. 361-315.000.
Schallenberger, John M.; Kmonk, Stanley; and Ferlan, Stephen J., 4,323,428, Cl. 376-353.000.
Sundar, Parameshwaran S., 4,323,540, Cl. 423-10.000.

Wexler, Allan; Chakrabarti, Paritosh M.; and Brown, Michael J., to GAF Corporation. Partial alkylation of polyhydroxybenzophenones. 4,323,710, Cl. 568-315.000.

Wheaton, Frank H., III; and Houghton, Curtis C., to Wheaton Industries. Bottle neck finish inspection apparatus. 4,323,158, Cl. 209-524.000.

Wheaton Industries: *See—*
Wheaton, Frank H., III; and Houghton, Curtis C., 4,323,158, Cl. 209-524.000.

White, Henry J. Harvesting machine for macademia nuts. 4,322,940, Cl. 56-328.00R.

Whitehurst, Darrell D.: *See—*
Haag, Werner O.; and Whitehurst, Darrell D., 4,323,698, Cl. 560-233.000.

Whiteside, Arliss E.; Freedman, Morris D.; Tasar, Omur; and Rothschild, Alexander M., to Bendix Corporation, The. Operations controller for a fault-tolerant multiple computer system. 4,323,966, Cl. 364-200.000.

Whitney, Douglas A., to Ford Motor Company. Multiple stage fluid pressure governor having two break points. 4,323,093, Cl. 137-56.000.

Whitney, Sherwood W. Self clearing raking attachment for mower. 4,322,936, Cl. 56-16.100.

Whorton, Robert B., III; Crosby, Samuel C., Jr.; Iannelli, Frank M.; Denmark, James; and Jeans, Edward L., to Tannetics, Inc. Beverage dispensing device and container therefor. 4,323,171, Cl. 222-82.000.

Widmer, Erich: *See—*
Lukac, Teodor; Widmer, Erich; and Zell, Reinhard, 4,323,711, Cl. 568-347.000.

Wiebusch, Wendy A., to Medtronic, Inc. Pacing lead. 4,323,081, Cl. 128-785.000.

Wiese, Winfred J., to Borg-Warner Corporation. Mechanical seal with eccentric seal faces. 4,323,255, Cl. 277-81.00R.

Wiggins, Richard H.; and Henderson, Alva E., to Texas Instruments Incorporated. Speech synthesis system with alternative coded or uncoded parameter formats. 4,323,732, Cl. 179-1.0SM.

Wiknich, Douglas D., to LaSalle Machine Tool, Inc. Accumulating conveyor. 4,323,152, Cl. 198-751.000.

Wilcox, Craig S.: *See—*
Breslow, Ronald C. D.; and Wilcox, Craig S., 4,323,512, Cl. 260-397.470.

Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., to United States of America, Navy. Sonobuoy system. 4,323,988, Cl. 367-4.000.

Willemsen, Gerrit J.: *See—*
Buhring, Otto; Dreessen, Gerardus J. W.; Groeneveld, Jacob W. H.; Queck, Robert; Thome, Heinrich; and Willemsen, Gerrit J., 4,323,718, Cl. 373-73.000.

Willey, Melvin G.: *See—*
Turner, Lloyd J.; Willey, Melvin G.; Tiegs, Sue M.; and Van Cleve, John E., Jr., 4,323,198, Cl. 241-5.000.

Williams, James A.: *See—*
Young, Richard N.; and Williams, James A., 4,323,827, Cl. 318-3.000.

Williams, Malcolm: *See—*
Woodhouse, Richard G.; and Williams, Malcolm, 4,323,042, Cl. 123-436.000.

Williams, Patrick Y. Folding frameworks and wheel-chairs. 4,323,133, Cl. 180-65.00R.

Willson, James R.; Conway, William H.; and Smith, William N., to Robertshaw Controls Company. Control system and control device for controlling a heating unit and method of making and operating the same. 4,323,764, Cl. 219-497.000.

Wilson, John J.: *See—*
Dempster, David F.; and Wilson, John J., 4,323,222, Cl. 254-274.000.

Wilson Jones Company: *See—*
Clark, John P.; Michaelis, Jack H.; and Malcik, Frank J., 4,323,318, Cl. 402-17.000.

Wilson, Lee E., to E-Systems, Inc. Rotary pipe joint. 4,323,268, Cl. 285-41.000.

Wilson, Robert M., to Jump for Joy Ltd. Jumping board. 4,323,231, Cl. 272-65.000.

Winkelman, Paul F., to United States of America, Energy. Overhead electric power transmission line jumpering system for bundles of five or more subconductors. 4,323,722, Cl. 174-43.000.

Winter, Robert A., to Sencore, Inc. Ohm meter with automatic lead resistance compensation. 4,323,972, Cl. 364-482.000.

Winter, Steven: *See—*
Soderberg, Richard; Winter, Steven; and Burst, Hermann, 4,323,274, Cl. 296-1.00S.

Wise, Kensall D.: *See—*
Masnari, Nino A.; Rensel, Walter B.; Robinson, Merrill G.; Solomon, David E.; Wise, Kensall D.; and Wuttke, Gilbert H., 4,323,420, Cl. 156-628.000.

Witney, Gary; and Visser, Harry, to Fish, Barry M. Capacitive sensor control system. 4,323,829, Cl. 318-55.000.

Witzenburg, Marion J., to Caterpillar Tractor Co. Pumpless flow system for a corrosive liquid. 4,323,452, Cl. 210-188.000.

Woditsch, Peter: *See—*
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,323,596, Cl. 427-127.000.

Wolf, Milton; and Fenichel, Richard L., to American Home Products Corporation. 4-Amino-2-substituted-5-pyrimidinecarboxamidoximes and carbothioamides. 4,323,681, Cl. 544-323.000.

Wolf, Peter, to Gunson S.A. (Proprietary) Limited. Monitoring light sensitive electronic components. 4,323,159, Cl. 209-548.000.

Wolf, Sylvan: *See—*
Will, Albert S.; Schuchard, Earl A.; Buckley, John P.; Cioccio, Armand; Hetzler, John C.; Wolf, Sylvan; Jefferson, Donald E.; McQuitty, Jim B.; and Urick, Robert A., 4,323,988, Cl. 367-4.000.

Wolflingseder, Hermann; and Wolflingseder, Werner, to Seraphin Pumpell & Sohne KG. Frame for spacing glass panes. 4,322,926, Cl. 52-172.000.

Wolflingseder, Werner: *See—*
Wolflingseder, Hermann; and Wolflingseder, Werner, 4,322,926, Cl. 52-172.000.

Wood, Thomas J. Apparatus for dispensing mastic material. 4,323,174, Cl. 222-146.00H.

Wood, William D.; and Davidson, Kenneth L. Circuit for driving electromagnetically-actuated displays. 4,323,894, Cl. 340-764.000.

Woodcock, Maurice L.: *See—*
Fritzsche, Alfred K.; Holladay, Harry P.; and Woodcock, Maurice L., 4,323,454, Cl. 210-321.100.

Woodhouse, Richard G.; and Williams, Malcolm, to Lucas Industries Limited. Fuel control system for an internal combustion engine. 4,323,042, Cl. 123-436.000.

Woods, John G.: *See—*
Tentarelli, Joseph A.; Wahlers, Richard L.; and Woods, John G., 4,323,875, Cl. 338-25.000.

Woods, Milton E.: *See—*
Hunsucker, Jerry H.; and Woods, Milton E., 4,323,624, Cl. 428-270.000.

Worrell, Gene T.: *See—*
Huckabee, Kermit D.; Adair, James C; and Worrell, Gene T., 4,323,989, Cl. 367-17.000.

Wossner, Gunter; and Maurer, Helmut, to Robert Bosch GmbH. Control apparatus for a fuel supply system for mixture-compressing, externally ignited internal combustion engines. 4,322,947, Cl. 60-285.000.

Wu, Chin T., to RCA Corporation. Hardware interpretive mode microprocessor. 4,323,963, Cl. 364-200.000.

Wunner, Roland, to LIBA Maschinenfabrik GmbH. Warp knitting machine arrangement. 4,322,956, Cl. 66-203.000.

Wurster, James C., to Super Products Corporation. Sewer and catch basin cleaner. 4,322,868, Cl. 15-302.000.

Wuttke, Gilbert H.: *See—*
Masnari, Nino A.; Rensel, Walter B.; Robinson, Merrill G.; Solomon, David E.; Wise, Kensall D.; and Wuttke, Gilbert H., 4,323,420, Cl. 156-628.000.

Wykes, John S.; and Adsley, Ian, to Coal Industry (Patents) Limited. Radiation detectors supported by resilient optical coupler. 4,323,778, Cl. 250-367.000.

Wyner, Elliot F.; and Lowry, Elvery D., to GTE Service Corporation. Electric discharge lamp. 4,323,812, Cl. 313-198.000.

Wytwornia Silnikow Wysokopreznych "PZL-Andrychow": *See—*
Blocki, Roman, 4,323,040, Cl. 123-389.000.

Xerox Corporation: *See—*
Thompson, Herbert E., 4,323,938, Cl. 360-105.000.

Xuan, Mai T.; Jufer, Marcel; and Pittet, Andre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Movement detector for a stepping motor. 4,323,834, Cl. 318-696.000.

Yakematsu, Yoshiyuki, to Fuji Koeki Corporation. Electric flash device. 4,323,822, Cl. 315-241.00P.

Yamada, Akira: *See—*
Fukazawa, Kazuo; and Yamada, Akira, 4,323,998, Cl. 369-43.000.

Yamada, Katuhiko: *See—*
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Mohvama, Yoshikuni, 4,323,306, Cl. 355-15.000.

Yamada, Tokuyoshi: *See—*
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,323,523, Cl. 264-8.000.

Yamada, Toshiaki: *See—*
Sakata, Kenji; Yamada, Toshiaki; Uchiyama, Kenji; and Hasegawa, Yugo, 4,323,600, Cl. 427-202.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Endo, Yoshinori; and Yoshikawa, Masaaki, 4,323,041, Cl. 123-432.000.
Kondo, Yasuo, 4,323,355, Cl. 440-76.000.
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,323,135, Cl. 180-228.000.
Yamashita, Ryuichi, 4,323,045, Cl. 123-570.000.

Yamamoto, Hideaki: *See—*
Koike, Norio; Tsukada, Toshihisa; Ando, Haruhisa; Yamamoto, Hideaki; Hirai, Tadaaki; Kubo, Masaharu; Maruyama, Eiichi; Baji, Toru; Takasaki, Yukio; and Nagahara, Shusaku, 4,323,912, Cl. 357-31.000.

Yamamoto, Kazuji: *See—*
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, 4,323,833, Cl. 318-376.000.

Yamamoto, Teruaki: *See—*
Schaer, Glenn R.; Touyama, Tasuku; Yamamoto, Teruaki; Honda, Keisuke; and Wada, Tatsuo, 4,323,441, Cl. 204-224.00R.

Yamashita, Gentaro: *See—*
Suzuki, Hideaki; and Yamashita, Gentaro, 4,323,486, Cl. 525-54.100.

Yamashita, Ryuichi, to Yamaha Hatsudoki Kabushiki Kaisha. Flow control device for exhaust gas recycling system. 4,323,045, Cl. 123-570.000.

Yamataka, Kazunori: *See—*
Kawamura, Chikayuki; isoya, Toshiro; and Yamataka, Kazunori, 4,323,444, Cl. 204-269.000.

Yamazaki, Kazuhide; Ogawa, Shigetoshi; Suma, Atsushi; and Nakajima, Maki, to Nippon Kokuyu Tetsudo; and Kabushiki Kaisha Shibaura Seisakusho. Tie tamper. 4,323,014, Cl. 104-13.000.

Yamazaki, Takeshi: *See—*
Kawabata, Nariyoshi; Yasuda, Shinichi; and Yamazaki, Takeshi, 4,323,702, Cl. 562-485.000.

Yanai, Toshiharu: *See—*
Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, 4,323,598, Cl. 427-160.000.

Yanmar Diesel Engine Co., Ltd.: *See—*
Tsugekawa, Takanori; Banba, Tosio; and Matsui, Masakuni, 4,323,039, Cl. 123-275.000.

Yasinovsky, Izrail L.: *See—*
Sereda, Alexandr I.; Nyagu, Ivan F.; Smirnov, Igor N.; Russu, Grigory I.; and Yasinovsky, Izrail L., 4,323,004, Cl. 99-275.000.

Yasuda, Shinichi: *See—*
Kawabata, Nariyoshi; Yasuda, Shinichi; and Yamazaki, Takeshi, 4,323,702, Cl. 562-485.000.

Yasuda, Takashi: *See—*
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,323,523, Cl. 264-8.000.

Yasui, Kiyoshi: *See—*
Kondo, Mitsuru; Iwasaki, Hiroshi; Yasui, Kiyoshi; and Miyake, Makoto, 4,323,700, Cl. 562-460.000.

Yokohama Rubber Co., Ltd., The: *See—*
Ahagon, Asahiro; Misawa, Makoto; Miyasaka, Kazuo; and Hirakawa, Hiroshi, 4,323,485, Cl. 525-237.000.

Yokoi, Shinji: *See—*
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,323,680, Cl. 544-293.000.

Yoshida, Kayoko: *See—*
Hasegawa, Masayasu; Nishikawa, Hideo; and Yoshida, Kayoko, 4,323,565, Cl. 424-246.000.

Yoshida, Kunio, to Sharp Kabushiki Kaisha. Repeatedly operable timer. 4,323,767, Cl. 235-92.0SH.

Yoshida, Minoru: *See—*
Nishimura, Hiroshi; Monma, Tetsuo; Yoshida, Minoru; Kirimoto, Kazunari; Hayamizu, Yoshio; and Nagasawa, Toshio, 4,323,607, Cl. 219-213.000.

Yoshida, Mitsuo; Masuda, Yoshinori; and Kashiwada, Akio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrolysis of alkali chloride. 4,323,434, Cl. 204-98.000.

Yoshida, Shuntaro: *See—*
Hasegawa, Takanori; Shimada, Takanobu; Sato, Takao; Kera, Masakazu; Yoshida, Shuntaro; and Shimoyama, Shinichi, 4,323,775, Cl. 250-317.100.

Yoshikawa, Masaaki: *See—*
Endo, Yoshinori; and Yoshikawa, Masaaki, 4,323,041, Cl. 123-432.000.

Yoshimoto, Takeo; Inoue, Takayuki; Michiyama, Hideo; Harayama, Takeo; Morikama, Osamu; Hojo, Yoshikata; Baba, Takao; Toyama, Teruhiko; Ura, Masaaki; and Takasawa, Yoshio, to Mitsui Toatsu Chemicals, Inc. Herbicidal compounds and compositions. 4,323,389, Cl. 71-124.000.

Yoshizawa, Naomi; and Terashima, Akira, to Pilot Mannenhitsu Kabushi Kaisha. Automatic transmission or recording or transmission and reception control system. 4,323,999, Cl. 369-19.000.

Young, James W., to Dresser Industries, Inc. Spring adjustment system for drill string tool. 4,323,128, Cl. 175-57.000.

Young, Peter L.: *See—*
Borrelli, Nicholas F.; and Young, Peter L., 4,323,640, Cl. 430-353.000.

Young, Richard N.; and Williams, James A., to Dana Corporation. Apparatus for controlling a two-speed shift motor. 4,323,827, Cl. 318-3.000.

Ypsilantis, Anna: *See—*
Ypsilantis, John; and Ypsilantis, Anna, 4,323,893, Cl. 340-756.000.

Ypsilantis, John; and Ypsilantis, Anna. Multi-segment alphanumeric display for Greek and English characters. 4,323,893, Cl. 340-756.000.

Yuasa Battery Company Limited: *See—*
Iwabuchi, Suminobu; and Matsui, Kazumasa, 4,323,620, Cl. 428-215.000.

Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Bar for printing an image. 4,323,927, Cl. 358-296.000.

Zabel, Bernd G., to Corvinus & Roth GmbH. Apparatus and process for detecting free chlorine. 4,323,092, Cl. 137-5.000.

Zadorozhny, Jury G.: *See—*
Alekhin, Stanislav A.; Kuznetsov, Eduard B.; Bakhir, Vitold M.; Klimenko, Vladimir I.; and Zadorozhny, Jury G., 4,323,445, Cl. 204-300.00R.

Zampini, Anthony, to Monsanto Company. Tube sheets for permeators. 4,323,453, Cl. 210-321.100.

Zed Instruments Limited: *See—*
Zollman, Peter M.; and Doyle, Keith G., 4,323,928, Cl. 358-299.000.

Zeilstra, Jacobus J.; de Klein, Willem J.; and Bik, Joannes D., to Akzona Incorporated. Novel branched-chain monoalcohols and derivatives thereof, lubricant compositions for polymers and wax compositions in which these novel products are incorporated. 4,323,495, Cl. 524-156.000.

Zell, Reinhard: *See*—
Lukac, Teodor; Widmer, Erich; and Zell, Reinhard, 4,323,711, Cl. 568-347.000.

Zelt, Edward J., to Stackpole Corporation, The. Permanent magnet field motor with radio frequency interference suppressing capacitor. 4,323,804, Cl. 310-72.000.

Zenith Radio Corporation: *See*—
Engel, Christopher M.; and Reneau, Daniel L., 4,323,917, Cl. 358-28.000.
Flasza, Michael D., 4,323,924, Cl. 358-188.000.
Reneau, Daniel L., 4,323,923, Cl. 358-171.000.

Zhirnov, Nikolai Y.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Andrian P.; and Kovalenko, Vladimir V., 4,323,479, Cl. 252-432.000.

Zils, James A.: *See*—
Hess, George M.; and Zils, James A., 4,323,015, Cl. 105-199.0CB.

Zimmerman, Charles J., to Carrier Corporation. Flow control apparatus. 4,323,116, Cl. 165-97.000.

Zimmerman, Robert L.: *See*—
Speranza, George P.; and Zimmerman, Robert L., 4,323,658, Cl. 521-174.000.

Zimmermann, Wolfgang; and Harreus, Albrecht, to Hoechst Aktiengesellschaft. Plasticizer containing polyvinyl alcohol granules. 4,323,492, Cl. 524-388.000.

Zingale, Salvatore L. Board game employing chance-taking means. 4,323,248, Cl. 273-236.000.

Zirn, Rudolf F.; and Karlsen, Erich. Insulating container for cooking food. 4,323,167, Cl. 220-408.000.

Zoecon Corporation: *See*—
Henrick, Clive A., 4,323,574, Cl. 424-263.000.

Zollman, Peter M.; and Doyle, Keith G., to Zed Instruments Limited. Copying process for producing a seamless copy from an unjointed original. 4,323,928, Cl. 358-299.000.

Zollner, Robert: *See*—
Mazanek, Jan; Gipp, Roland; Zollner, Robert; Seifert, Peter; Wagner, Kuuno; and Blahak, Johannes, 4,323,657, Cl. 521-116.000.

Zum Bahlen, Ralph E.: *See*—
Fowler, Paul J.; and Zum Bahlen, Ralph E., 4,323,316, Cl. 400-91.000.

Zumfeld, Heinz: *See*—
Rohner, Joachim; and Zumfeld, Heinz, 4,322,943, Cl. 57-261.000.

Zweifel, Hans: *See*—
Bosshard, Hans; Rempfler, Hermann; and Zweifel, Hans, 4,323,701, Cl. 562-462.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF APRIL, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Automotive Products Limited: *See—*
Jenkins, Stanley F. N.; Fairclough, Roy; Howard, Brian A.; and Miley, Frederick, Re. 30,896, Cl. 244-104.0FP.

Butera, Anthony W. Filter paper dispenser. Re. 30,895, Cl. 225-42.000.

Cantrell, Cyrus D.; Carbone, Robert J.; and Cooper, Ralph, to United States of America, Energy. Infrared laser system. Re. 30,898, Cl. 307-426.000.

Carbone, Robert J.: *See—*
Cantrell, Cyrus D.; Carbone, Robert J.; and Cooper, Ralph, Re. 30,898, Cl. 307-426.000.

Cooper, Ralph: *See—*
Cantrell, Cyrus D.; Carbone, Robert J.; and Cooper, Ralph, Re. 30,898, Cl. 307-426.000.

Fairclough, Roy: *See—*
Jenkins, Stanley F. N.; Fairclough, Roy; Howard, Brian A.; and Miley, Frederick, Re. 30,896, Cl. 244-104.0FP.

Hikosaka, Takashi: *See—*
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, Re. 30,897, Cl. 355-3.00R.

Howard, Brian A.: *See—*
Jenkins, Stanley F. N.; Fairclough, Roy; Howard, Brian A.; and Miley, Frederick, Re. 30,896, Cl. 244-104.0FP.

Imaizumi, Koji: *See—*
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, Re. 30,897, Cl. 355-3.00R.

Jenkins, Stanley F. N.; Fairclough, Roy; Howard, Brian A.; and Miley, Frederick, to Automotive Products Limited. Aircraft undercarriage suspension. Re. 30,896, Cl. 244-104.0FP.

Johns-Manville Corporation: *See—*
Puchosic, John E., Re. 30,893, Cl. 53-436.000.

Miley, Frederick: *See—*
Jenkins, Stanley F. N.; Fairclough, Roy; Howard, Brian A.; and Miley, Frederick, Re. 30,896, Cl. 244-104.0FP.

Minolta Camera Kabushiki Kaisha: *See—*
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, Re. 30,897, Cl. 355-3.00R.

Puchosic, John E., to Johns-Manville Corporation. Method of vacuum packaging compressible materials and apparatus. Re. 30,893, Cl. 53-436.000.

Schuman, Mark. Oscillating piston apparatus. Re. 30,894, Cl. 60-520.000.

United States of America
Energy: *See—*
Cantrell, Cyrus D.; Carbone, Robert J.; and Cooper, Ralph, Re. 30,898, Cl. 307-426.000.

Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus with gas evacuating means. Re. 30,897, Cl. 355-3.00R.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See—*
Johnson, Peter C.; Quin, Ralph M., Jr.; and Ziegler, John S., 263,746, Cl. D24-58.000.

Acero, Steve A.; and Rougeau, Edward L. Ventilating hood for an electroplating tank. 263,737, 4-6-82, Cl. D23-151.000.

Adkinson, Joseph E. Etagere or the like. 263,666, 4-6-82, Cl. D6-186.000.

AGFA-Gevaert Aktiengesellschaft: *See—*
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,717, Cl. D16-1.000.

Aktieselskabet Brodrene Hartmann: *See—*
Schroder, Jorgen, 263,680, Cl. D9-341.000.

Albert, Thomas W., to American Hospital Supply Corp. Dental handpiece wrench. 263,742, 4-6-82, Cl. D24-12.000.

Amba Marketing Systems, Inc.: *See—*
Schimmel, Otto K., 263,648, Cl. D3-44.000.
Schimmel, Otto K., 263,649, Cl. D3-52.000.
Schimmel, Otto K., 263,650, Cl. D3-53.000.

American Hospital Supply Corp.: *See—*
Albert, Thomas W., 263,742, Cl. D24-12.000.

Anderson, Gerald R. Rotating modular album holder and supporting base therefor. 263,665, 4-6-82, Cl. D6-185.000.

Andersson, Viktor. Playing spinning disc indicator. 263,726, 4-6-82, Cl. D21-39.000.

Ando, Shoichi. Transmitter. 263,709, 4-6-82, Cl. D14-95.000.

Apex Foot Products Corp.: *See—*
Vinnecour, Keith E.; and Schwartz, Richard B., 263,644, Cl. D2-318.000.

Arendt, Gernot, to Semperit Aktiengesellschaft. Tire. 263,694, 4-6-82, Cl. D12-143.000.

Asano, Masakatsu, to General Corporation, The. Display apparatus or similar article. 263,710, 4-6-82, Cl. D14-106.000.

Baer, William F. Vibratory tumbler. 263,713, 4-6-82, Cl. D15-124.000.

Bash, Charles M., to Prince Manufacturing. Tennis racket. 263,729, 4-6-82, Cl. D21-212.000.

Bean Station Furniture Company, The: *See—*
Williams, David P. G., 263,656, Cl. D6-62.000.

Bechtel, Daniel L. Rifle telescope mount. 263,732, 4-6-82, Cl. D22-7.000.

Black & Decker Inc.: *See—*
Straub, Robert P., 263,744, Cl. D24-28.000.

Blasnik, William: *See—*
Bologna, Joseph; Blasnik, William; and Torbet, Philip, 263,688, Cl. D10-60.000.

Bogo Sales Co.: *See—*
Bologna, Joseph; Blasnik, William; and Torbet, Philip, 263,688, Cl. D10-60.000.

Bologna, Joseph; Blasnik, William; and Torbet, Philip, to Bogo Sales Co. Thermostat casing. 263,688, 4-6-82, Cl. D10-60.000.

Booth, Mark A. Table top golf game board. 263,725, 4-6-82, Cl. D21-27.000.

Bore, Bjarne J. Animal feeder. 263,763, 4-6-82, Cl. D30-15.000.

Borichevsky, Donald J., to Telescope Folding Furniture Co., Inc., The. Sling chair. 263,654, 4-6-82, Cl. D6-41.000.

Brent, Richard W.: *See—*
Cunningham, Donald M.; Brent, Richard W.; and Stover, John C., 263,734, Cl. D23-77.000.

Carrier Corporation: *See—*
Hoyle, Walter W., 263,736, Cl. D23-141.000.

Chan, Ying H., to Starry Electric Manufactory Ltd. Food mixer power unit. 263,671, 4-6-82, Cl. D7-158.000.

Citizen Watch Co., Ltd.: *See—*
Fukumura, Yutaka, 263,687, Cl. D10-39.000.

Claman, Mike T., to Lewittes Furniture Enterprises, Inc. Loveseat. 263,655, 4-6-82, Cl. D6-57.000.

Clark, Charles A. Paint brush extension clamp. 263,677, 4-6-82, Cl. D8-396.000.

Cohen, Arthur B.: *See—*
Cohen, Francine H.; and Cohen, Arthur B., 263,659, Cl. D6-83.000.

Cohen, Francine H.; and Cohen, Arthur B. Mattress enclosure. 263,659, 4-6-82, Cl. D6-83.000.

Colley, Shirley M. Overshoe. 263,642, 4-6-82, Cl. D2-271.000.

Collins, Scott J., to Georgia-Pacific Corporation. Napkin dispenser. 263,669, 4-6-82, Cl. D7-72.000.

Collister, Kenneth D., to Miles Laboratories, Inc. Test device. 263,741, 4-6-82, Cl. D24-21.000.

Comtrex Systems Corporation: *See—*
Maladra, Anthony; Frohlking, Adolf; and Horton, George, 263,722, Cl. D18-4.000.
Maladra, Anthony; Frohlking, Adolf; and Horton, George, 263,723, Cl. D18-4.000.

Conrad, Walter W., to W W Industries, Inc. Belt loader. 263,692, 4-6-82, Cl. D34-29.000.

Cunningham, Donald M.; Brent, Richard W.; and Stover, John C., to Emerson Electric Co. Metal extrusion for an electric heating element. 263,734, 4-6-82, Cl. D23-77.000.

Dallaire, Raymond. Window component extrusion. 263,750, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,751, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,752, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,753, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,754, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,755, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,756, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,757, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,758, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,759, 4-6-82, Cl. D25-74.000.

Dallaire, Raymond. Window component extrusion. 263,760, 4-6-82, Cl. D25-74.000.

Davie, Ricky L.: *See—*
Kaiser, James S.; Vincent, John D.; Vincent, Roger C.; and Davie, Ricky L., 263,693, Cl. D12-110.000.

Davis, Paul, to Sweetheart Plastics, Inc. Container for food or the like. 263,684, 4-6-82, Cl. D9-426.000.

Dean, Dennis N., to Modesett, Norman L. Fuel injection nozzle. 263,711, 4-6-82, Cl. D15-5.000.

Decra-Stone, Inc.: *See—*
Knutson, Lawrence M., 263,668, Cl. D7-29.000.

Desport Limited: *See—*
Ming, Wong, 263,718, Cl. D16-19.000.

Dewey, George G., to Illinois Tool Works Inc. Roof insulation washer. 263,678, 4-6-82, Cl. D8-399.000.

Ebert, Karl, to Max Widenmann Armaturenfabrik. Combination hydrant spanner and lug wrench. 263,674, 4-6-82, Cl. D8-27.000.

Echo Sonic Co., Ltd.: *See—*
Morita, Kaoru, 263,701, Cl. D14-11.000.

Emerson Electric Co.: *See—*
Cunningham, Donald M.; Brent, Richard W.; and Stover, John C., 263,734, Cl. D23-77.000.

Finnerty, Hugh J.: *See—*
Laub, Bernard C., 263,690, Cl. D34-24.000.

Franzblau, Abraham. Lamp base. 263,762, 4-6-82, Cl. D26-93.000.

Frieberg, Bengt O. Reversible lock washer. 263,679, 4-6-82, Cl. D8-399.000.

Frohlking, Adolf: *See—*
Maladra, Anthony; Frohlking, Adolf; and Horton, George, 263,722, Cl. D18-4.000.
Maladra, Anthony; Frohlking, Adolf; and Horton, George, 263,723, Cl. D18-4.000.

Fukumura, Yutaka, to Citizen Watch Co., Ltd. Wrist watch. 263,687, 4-6-82, Cl. D10-39.000.

Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Vehicular telephone set. 263,702, 4-6-82, Cl. D14-53.000.

Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Portable wireless telephone set. 263,703, 4-6-82, Cl. D14-53.000.

Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Portable wireless telephone set. 263,704, 4-6-82, Cl. D14-53.000.

Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Portable wireless telephone set. 263,705, 4-6-82, Cl. D14-53.000.

Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Portable wireless telephone set. 263,706, 4-6-82, Cl. D14-53.000.

Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Dialing pad. 263,707, 4-6-82, Cl. D14-66.000.

Futurecraft Corporation: *See—*
Piet, Meyer; and Giles, Dean G., 263,739, Cl. D24-10.000.

General Corporation, The: *See—*
Asano, Masakatsu, 263,710, Cl. D14-106.000.

General Electric Company: *See—*
Shalvoy, John C., 263,672, Cl. D32-70.000.

Georgia-Pacific Corporation: *See—*
Collins, Scott J., 263,669, Cl. D7-72.000.

Giles, Dean G.: *See—*
Piet, Meyer; and Giles, Dean G., 263,739, Cl. D24-10.000.

Glassman, Fredrick R. Light fixture. 263,761, 4-6-82, Cl. D26-83.000.

Globus, Richard D.: *See—*
Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., 263,716, Cl. D16-1.000.

Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., to Globuscope, Inc. Panoramic camera. 263,716, 4-6-82, Cl. D16-1.000.

Globus, Stephen E.: *See—*
Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., 263,716, Cl. D16-1.000.

Globuscope, Inc.: *See—*
Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., 263,716, Cl. D16-1.000.

Guardian Packaging Corporation: *See—*
Parr, Raymond A., 263,681, Cl. D9-341.000.
Urciuoli, Henry R., 263,682, Cl. D9-341.000.

Hirooka, Junji: *See—*
Fukushima, Hisao; and Hirooka, Junji, 263,702, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,703, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,704, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,705, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,706, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,707, Cl. D14-66.000.

Horne, Robert H.: *See—*
Rogers, Robert K.; Steuer, Robert R.; Mackay, F. Gordon; Mackay, Spencer L.; and Horne, Robert H., 263,740, Cl. D24-17.000.

Horton, George: *See—*
Maladra, Anthony; Frohlking, Adolf; and Horton, George, 263,722, Cl. D18-4.000.
Maladra, Anthony; Frohlking, Adolf; and Horton, George, 263,723, Cl. D18-4.000.

Hoyle, Walter W., to Carrier Corporation. Front panel for an air conditioning unit. 263,736, 4-6-82, Cl. D23-141.000.

Illinois Tool Works Inc.: *See—*
Dewey, George G., 263,678, Cl. D8-399.000.

Intra-Medical Pharmaceuticals Ltd.: *See—*
Priestman, Anthony, 263,743, Cl. D24-19.000.

Jaramillo, Guillermo; and Jaramillo, Maria E. Nose straightener. 263,747, 4-6-82, Cl. D24-64.000.

Jaramillo, Maria E.: *See—*
Jaramillo, Guillermo; and Jaramillo, Maria E., 263,747, Cl. D24-64.000.

Jeremiah, Bruce S. Jewelry display card. 263,686, 4-6-82, Cl. D9-457.000.

Johnson, Peter C.; Quin, Ralph M., Jr.; and Ziegler, John S., to Abbott Laboratories. Flexible container for medical liquids. 263,746, 4-6-82, Cl. D24-58.000.

Jungle Feet: *See—*
Railton, Jeremy J., 263,646, Cl. D2-321.000.
Railton, Jeremy J., 263,647, Cl. D2-321.000.

Kaiser, James S.; Vincent, John D.; Vincent, Roger C.; and Davie, Ricky L., to Kaiser, James Stewart; Vincent, John Denny; and Vincent, Roger C. Three wheel motorcycle body. 263,693, 4-6-82, Cl. D12-110.000.

Kaiser, James Stewart: *See—*
Kaiser, James S.; Vincent, John D.; Vincent, Roger C.; and Davie, Ricky L., 263,693, Cl. D12-110.000.

Keds Corporation, The: *See—*
Mastrantuone, Robert J., 263,645, Cl. D2-320.000.

Ketcham & McDougall, Inc.: *See—*
Laughlin, Clayton A., 263,724, Cl. D19-92.000.

Kice, Warren B. Cassette deck. 263,700, 4-6-82, Cl. D14-6.000.

Knutson, Lawrence M., to Decra-Stone, Inc. Bowl. 263,668, 4-6-82, Cl. D7-29.000.

Kojima, Fumiyo: *See—*
Matsumoto, Nobuki; Yoshihama, Manzo; and Kojima, Fumiyo, 263,708, Cl. D14-94.000.

Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr. Adjustable exercise bench. 263,728, 4-6-82, Cl. D21-191.000.

Lambert, Lloyd J., Sr.: *See—*
Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr., 263,728, Cl. D21-191.000.

Laub, Bernard C., to Finnerty, Hugh J. Baseball equipment cart. 263,690, 4-6-82, Cl. D34-24.000.

Laughlin, Clayton A., to Ketcham & McDougall, Inc. Combined paper tray and paperweight. 263,724, 4-6-82, Cl. D19-92.000.

Lever Brothers Company: *See—*
Mansau, Serge, 263,683, Cl. D9-400.000.

Lewittes Furniture Enterprises, Inc.: *See—*
Claman, Mike T., 263,655, Cl. D6-57.000.

Loof, Goran; and Skarin, Lars, to Partex Fabriksaktiebolag. Sleeve for marking electrical wires and cables. 263,698, 4-6-82, Cl. D13-13.000.

Mackay, F. Gordon: *See—*
Rogers, Robert K.; Steuer, Robert R.; Mackay, F. Gordon; Mackay, Spencer L.; and Horne, Robert H., 263,740, Cl. D24-17.000.

Mackay, Spencer L.: *See—*
Rogers, Robert K.; Steuer, Robert R.; Mackay, F. Gordon; Mackay, Spencer L.; and Horne, Robert H., 263,740, Cl. D24-17.000.

Maladra, Anthony; Frohlking, Adolf; and Horton, George, to Comtrex Systems Corporation. Cash register housing. 263,722, 4-6-82, Cl. D18-4.000.

Maladra, Anthony; Frohlking, Adolf; and Horton, George, to Comtrex Systems Corporation. Cash register housing. 263,723, 4-6-82, Cl. D18-4.000.

Mansau, Serge, to Lever Brothers Company. Bottle or similar article. 263,683, 4-6-82, Cl. D9-400.000.

Marcuse, John W.: *See—*
Vest, Gary W.; and Marcuse, John W., 263,699, Cl. D13-28.000.

Mastrantuone, Robert J., to Keds Corporation, The. Sole for a shoe. 263,645, 4-6-82, Cl. D2-320.000.

Mathews, Thomas J. Running board. 263,697, 4-6-82, Cl. D12-203.000.

Matsumoto, Nobuki; Yoshihama, Manzo; and Kojima, Fumiyo, to Ricoh Company, Ltd. Facsimile recorder and transceiver. 263,708, 4-6-82, Cl. D14-94.000.

Max Widenmann Armaturenfabrik: *See—*
Ebert, Karl, 263,674, Cl. D8-27.000.

McBride, John P., II. Animal identification disk and the like. 263,764, 4-6-82, Cl. D30-43.000.

McConnell, Robert D. Photo video analyzer and printer or similar article. 263,719, 4-6-82. Cl. D16-28.000.

Meo, Santino D., to Tri-Delta Industries, Inc. Combined key holder and light. 263,651, 4-6-82, Cl. D3-63.000.

Miles Laboratories, Inc.: *See*—
Collister, Kenneth D., 263,741, Cl. D24-21.000.

Miller, Jack V. Window component extrusion. 263,748, 4-6-82, Cl. D25-74.000.

Miller, Michael L., to Vemco Corporation. Drafting machine scale magnifier attachment. 263,721, 4-6-82, Cl. D16-135.000.

Ming, Wong, to Desport Limited. Combined viewer and projector. 263,718, 4-6-82, Cl. D16-19.000.

Modesett, Norman L.: *See*—
Dean, Dennis N., 263,711, Cl. D15-5.000.

Moore, Charles F. Seashell display. 263,689, 4-6-82, Cl. D11-135.000.

Moreau, Roger C. Hammock. 263,663, 4-6-82, Cl. D6-113.000.

Morita, Kaoru, to Echo Sonic Co., Ltd. Tape cartridge. 263,701, 4-6-82, Cl. D14-11.000.

Multitronics Corporation: *See*—
Rogers, Robert K.; Steuer, Robert R.; Mackay, F. Gordon; Mackay, Spencer L.; and Horne, Robert H., 263,740, Cl. D24-17.000.

Nandorf, Rutger. Patient supporting harness or similar article. 263,640, 4-6-82, Cl. D2-27.000.

Nandorf, Rutger. Wheel chair positioning harness or the like. 263,641, 4-6-82, Cl. D2-27.000.

New Era Products, Inc.: *See*—
Vest, Gary W.; and Marcuse, John W., 263,699, Cl. D13-28.000.

Oki Electric Industry Co., Ltd.: *See*—
Fukushima, Hisao; and Hirooka, Junji, 263,702, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,703, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,704, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,705, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,706, Cl. D14-53.000.
Fukushima, Hisao; and Hirooka, Junji, 263,707, Cl. D14-66.000.

Oribin, Edwin H., to Oribin, Edwin Henry; and Oribin, Joyce Isobel. Connector bracket for a collapsible tent frame. 263,730, 4-6-82, Cl. D21-254.000.

Oribin, Edwin Henry: *See*—
Oribin, Edwin H., 263,730, Cl. D21-254.000.

Oribin, Joyce Isobel: *See*—
Oribin, Edwin H., 263,730, Cl. D21-254.000.

Oskwarek, Stanley M. Stovepipe adaptor for a fireplace damper. 263,735, 4-6-82, Cl. D23-127.000.

Paramount Pictures Corporation: *See*—
Probert, Andrew G., 263,727, Cl. D21-87.000.

Parr, Raymond A., to Guardian Packaging Corporation. Jelly cup tray. 263,681, 4-6-82, Cl. D9-341.000.

Partex Fabriksaktiebolag: *See*—
Loof, Goran; and Skarin, Lars, 263,698, Cl. D13-13.000.

Peavey, Hartley D. Guitar case. 263,652, 4-6-82, Cl. D3-73.000.

Phillips Petroleum Company: *See*—
Smith, Ernest L., 263,685, Cl. D9-452.000.

Piet, Meyer; and Giles, Dean G., to Futurecraft Corporation. Amalgamator. 263,739, 4-6-82, Cl. D24-10.000.

Precisioneering Limited: *See*—
Sixsmith, Richard, 263,738, Cl. D23-163.000.

Priestman, Anthony, to Intra-Medical Pharmaceuticals Ltd. Tongue depressor. 263,743, 4-6-82, Cl. D24-19.000.

Primault, Andre, to Societe Generale de Fonderie. Bath safety handle. 263,660, 4-6-82, Cl. D6-86.000.

Prince Manufacturing: *See*—
Bash, Charles M., 263,729, Cl. D21-212.000.

Probert, Andrew G., to Paramount Pictures Corporation. Toy spaceship. 263,727, 4-6-82, Cl. D21-87.000.

Quin, Ralph M., Jr.: *See*—
Johnson, Peter C.; Quin, Ralph M., Jr.; and Ziegler, John S., 263,746, Cl. D24-58.000.

Railton, Jeremy J., to Jungle Feet. Shoe sole. 263,646, 4-6-82, Cl. D2-321.000.

Railton, Jeremy J., to Jungle Feet. Shoe sole. 263,647, 4-6-82, Cl. D2-321.000.

Reber, Russell A. Antenna mounting device. 263,695, 4-6-82, Cl. D12-155.000.

Regler, Ingemar, to Safety Vehicles Development A.B. Splash guard for mounting behind a vehicle wheel. 263,696, 4-6-82, Cl. D12-185.000.

Ricoh Company, Ltd.: *See*—
Matsumoto, Nobuki; Yoshihama, Manzo; and Kojima, Fumiyo, 263,708, Cl. D14-94.000.

Rixen, Edgar, to Robert Krups, Firma. Foldable slicing machine. 263,712, 4-6-82, Cl. D15-97.000.

Robert Krups, Firma: *See*—
Rixen, Edgar, 263,712, Cl. D15-97.000.

Rogers, Robert K.; Steuer, Robert R.; Mackay, F. Gordon; Mackay, Spencer L.; and Horne, Robert H., to Multitronics Corporation. Miniature cardiotachometer or the like. 263,740, 4-6-82, Cl. D24-17.000.

Rougeau, Edward L.: *See*—
Acero, Steve A.; and Rougeau, Edward L., 263,737, Cl. D23-151.000.

Rubner, Karlheinz: *See*—
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,717, Cl. D16-1.000.

Safety Vehicles Development A.B.: *See*—
Regler, Ingemar, 263,696, Cl. D12-185.000.

Sandel, Dan. Design for surgical instrument holder. 263,745, 4-6-82, Cl. D24-29.000.

Saporiti, Giorgio. Sofa. 263,657, 4-6-82, Cl. D6-63.000.

Saporiti, Giorgio. Armchair. 263,658, 4-6-82, Cl. D6-71.000.

Schawalder, Albert C. Cooking pan. 263,670, 4-6-82, Cl. D7-95.000.

Schimmel, Otto K., to Amba Marketing Systems, Inc. Handbag. 263,648, 4-6-82, Cl. D3-44.000.

Schimmel, Otto K., to Amba Marketing Systems, Inc. Handbag. 263,649, 4-6-82, Cl. D3-52.000.

Schimmel, Otto K., to Amba Marketing Systems, Inc. Handbag. 263,650, 4-6-82, Cl. D3-53.000.

Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, to AGFA-Gevaert Aktiengesellschaft. Photographic camera. 263,717, 4-6-82, Cl. D16-1.000.

Schroder, Jorgen, to Aktieselskabet Brodrene Hartmann. Egg carton. 263,680, 4-6-82, Cl. D9-341.000.

Schultes, Herbert: *See*—
Schlagheck, Norbert; Schultes, Herbert; and Rubner, Karlheinz, 263,717, Cl. D16-1.000.

Schwartz, Richard B.: *See*—
Vinnecour, Keith E.; and Schwartz, Richard B., 263,644, Cl. D2-318.000.

Semperit Aktiengesellschaft: *See*—
Arendt, Gernot, 263,694, Cl. D12-143.000.

Shalvoy, John C., to General Electric Company. Iron or similar article. 263,672, 4-6-82, Cl. D32-70.000.

Sheehan, John J. Pry tool for plastic tubs or the like. 263,673, 4-6-82, Cl. D8-18.000.

Shepherd, William, to Youth Enterprises Trading Services Pty. Ltd. Roller skate plate. 263,731, 4-6-82, Cl. D21-226.000.

Sixsmith, Richard, to Precisioneering Limited. Mist eliminator blade for air handling systems. 263,738, 4-6-82, Cl. D23-163.000.

Skarin, Lars: *See*—
Loof, Goran; and Skarin, Lars, 263,698, Cl. D13-13.000.

Smith, Ernest L., to Phillips Petroleum Company. Closure or similar article. 263,685, 4-6-82, Cl. D9-452.000.

Societe Generale de Fonderie: *See*—
Primault, Andre, 263,660, Cl. D6-86.000.

Societe Technisynthese (S.A.R.L.): *See*—
Vermonet, Christian, 263,643, Cl. D2-309.000.

Sorensen, Norman L., to Wisco Corporation. Sunroof panel seal. 263,749, 4-6-82, Cl. D25-74.000.

Starry Electric Manufactory Ltd.: *See*—
Chan, Ying H., 263,671, Cl. D7-158.000.

Steuer, Robert R.: *See*—
Rogers, Robert K.; Steuer, Robert R.; Mackay, F. Gordon; Mackay, Spencer L.; and Horne, Robert H., 263,740, Cl. D24-17.000.

Stover, John C.: *See*—
Cunningham, Donald M.; Brent, Richard W.; and Stover, John C., 263,734, Cl. D23-77.000.

Straub, Robert P., to Black & Decker Inc. Cast cutter. 263,744, 4-6-82, Cl. D24-28.000.

Streiff, W. Lynn. Cart. 263,691, 4-6-82, Cl. D34-26.000.

Sweetheart Plastics, Inc.: *See*—
Davis, Paul, 263,684, Cl. D9-426.000.

Takematsu, Yoshiyuki. Electric flash device for camera. 263,720, 4-6-82, Cl. D16-42.000.

Telescope Folding Furniture Co., Inc., The: *See*—
Borichevsky, Donald J., 263,654, Cl. D6-41.000.

Thompson, Bruce R., to UPL Group Limited. Towel rack. 263,661, 4-6-82, Cl. D6-99.000.

Thompson, Bruce R., to UPL Group Limited. Towel rack. 263,662, 4-6-82, Cl. D6-99.000.

Torbet, Philip: *See*—
Bologna, Joseph; Blasnik, William; and Torbet, Philip, 263,688, Cl. D10-60.000.

Treloar, Howard A. Lathe tool holder. 263,714, 4-6-82, Cl. D15-140.000.

Tri-Delta Industries, Inc.: *See*—
Meo, Santino D., 263,651, Cl. D3-63.000.

Turcotte, Sidney Joseph E., Jr. Liqueur service tray. 263,667, 4-6-82, Cl. D7-22.000.

UPL Group Limited: *See*—
Thompson, Bruce R., 263,661, Cl. D6-99.000.
Thompson, Bruce R., 263,662, Cl. D6-99.000.

Urciuoli, Henry R., to Guardian Packaging Corporation. Jelly cup tray. 263,682, 4-6-82, Cl. D9-341.000.

Van Schayik, Leonardus J. F. Kitchen module. 263,733, 4-6-82, Cl. D23-50.000.

Vemco Corporation: *See*—
Miller, Michael L., 263,721, Cl. D16-135.000.

Vermonet, Christian, to Societe Technisynthese (S.A.R.L.). Shoe. 263,643, 4-6-82, Cl. D2-309.300.

Vest, Gary W.; and Marcuse, John W., to New Era Products, Inc. Power cord plug. 263,699, 4-6-82, Cl. D13-28.000.

Viets, William. Combined clothes tree and height measuring unit. 263,653, 4-6-82, Cl. D6-28.000.

Vincent, John D.: *See*—
Kaiser, James S.; Vincent, John D.; Vincent, Roger C.; and Davie, Ricky L., 263,693, Cl. D12-110.000.

Vincent, John Denny: *See*—
Kaiser, James S.; Vincent, John D.; Vincent, Roger C.; and Davie, Ricky L., 263,693, Cl. D12-110.000.
Vincent, Roger C.: *See*—
Kaiser, James S.; Vincent, John D.; Vincent, Roger C.; and Davie, Ricky L., 263,693, Cl. D12-110.000.
Vinnecour, Keith E.; and Schwartz, Richard B., to Apex Foot Products Corp. Innersole. 263,644, 4-6-82, Cl. D2-318.000.
Vorves, Steve P. Strike plate. 263,675, 4-6-82, Cl. D8-343.000.
W W Industries, Inc.: *See*—
Conrad, Walter W., 263,692, Cl. D34-29.000.
Wahlin, Olof B. Lock housing with connecting mechanisms. 263,676, 4-6-82, Cl. D8-382.000.
Walter, Leonard J. Funnel. 263,715, 4-6-82, Cl. D15-199.000.
Williams, David P. G., to Bean Station Furniture Company, The. Seat. 263,656, 4-6-82, Cl. D6-62.000.
Wisco Corporation: *See*—
Sorensen, Norman L., 263,749, Cl. D25-74.000.
Workman, Wayne C. Fast food service table. 263,664, 4-6-82, Cl. D6-164.000.
Yoshihama, Manzo: *See*—
Matsumoto, Nobuki; Yoshihama, Manzo; and Kojima, Fumiyo, 263,708, Cl. D14-94.000.
Youth Enterprises Trading Services Pty. Ltd.: *See*—
Shepherd, William, 263,731, Cl. D21-226.000.
Ziegler, John S.: *See*—
Johnson, Peter C.; Quin, Ralph M., Jr.; and Ziegler, John S., 263,746, Cl. D24-58.000.

LIST OF PLANT PATENTEES

Aldridge Nursery, Inc.: *See*—
Aldridge, Richard C., Jr., 4,836, Cl. 54.000.
Aldridge, Richard C., Jr., to Aldridge Nursery, Inc. *Nerium indicum*—Little Red variety. 4,836, 4-6-82, Cl. 54.000.
Nor'East Miniature Roses, Inc.: *See*—
Spies, Mark C., 4,835, Cl. 9.000.
Spies, Mark C., to Nor'East Miniature Roses, Inc. Light pink miniature rose. 4,835, 4-6-82, Cl. 9.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 6TH DAY OF APRIL, 1982

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Barton, Kenneth R.; and McConnell, Richard L. Textile sizing compositions. T101,702, 4-6-82, Cl. 526-352.000.
Egbert, William E. Portable programmable calculator. T101,701, 4-6-82, Cl. 364-706.000.
McConnell, Richard L.: *See*—
Barton, Kenneth R.; and McConnell, Richard L., T101,702, Cl. 526-352.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 6, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,322,858
4,322,859

CLASS 4

490 4,322,860

CLASS 5

170 MT 4,322,921

CLASS 6

4 R 4,322,861
5 4,322,862

CLASS 8

94.11 4,323,358
155 4,323,359
407 4,323,360
444 4,323,361
506 4,323,362
532 4,323,363

CLASS 12

12.5 4,322,863
24.5 4,322,864

CLASS 15

119 A 4,322,865
180 4,322,866
302 4,322,868

CLASS 16

46 4,322,869
235 4,322,870

CLASS 17

1 F 4,322,871
12 4,322,872
21 4,322,873
44.4 4,322,874

CLASS 23

230 R 4,323,364
313 R 4,323,365

CLASS 24

204 4,322,875

CLASS 29

25.19 4,322,876
25.35 4,322,877
148.4 C 4,322,878
4,322,879
452 4,322,880
571 4,322,881
4,322,882
578 4,322,883
602 R 4,322,884

CLASS 30

162 4,322,885
312 4,322,886

CLASS 33

174 C 4,322,887
178 D 4,322,888
179.5 R 4,322,889
288 4,322,890

CLASS 36

29 4,322,891
4,322,892
43 4,322,893
114 4,322,894
129 4,322,895

CLASS 37

43 E 4,322,896
62 4,322,897
64 4,322,898
86 4,322,899

CLASS 38

77.6 4,322,900
102.6 4,322,901

CLASS 40

322 4,322,902
489 4,322,903
495 4,322,904
606 4,322,905

CLASS 42

70 E 4,322,906
88 4,322,907

CLASS 43

3 4,322,908

CLASS 46

14 4,322,909

CLASS 47

1.7 4,322,910
45 4,322,911

CLASS 48

73 4,323,366
197 A 4,323,367
202 4,323,368

CLASS 49

28 4,322,912
168 4,322,913
370 4,322,914

CLASS 51

3 4,322,915
78 4,322,916
123 R 4,322,917
138 4,322,918
139 4,322,919
168 4,322,920
325 4,322,922

CLASS 52

2 4,322,923
57 4,322,924
143 4,322,925
172 4,322,926
188 4,322,927
521 4,322,928

CLASS 53

436 Re.30,893
449 4,322,931
451 4,322,929
471 4,322,930
505 4,322,932

CLASS 55

1 4,323,369
18 4,323,370
19 4,323,371
59 4,323,372
96 4,323,373
132 4,323,374
270 4,323,375
304 4,323,376
341 HM 4,323,377
378 4,323,378
511 4,323,379

CLASS 56

10.2 4,322,933
4,322,937
11.1 4,322,934
11.3 4,322,935
16.1 4,322,936
320.2 4,322,938
328 R 4,322,939
4,322,940

CLASS 57

16 4,322,941
261 4,322,943
328 4,322,944
411 4,322,942

CLASS 60

39.32 4,322,945
203.1 4,322,946
285 4,322,947
520 Re.30,894
602 4,322,948
606 4,322,949
712 4,322,950

CLASS 62

28 4,323,380
101 4,322,951
198 4,322,952
217 4,322,953
371 4,322,954

CLASS 64

16 4,322,955

CLASS 65

32 4,323,381
70 4,323,382
135 4,323,383
335 4,323,384
351 4,323,385

CLASS 66

203 4,322,956

CLASS 68

13 R 4,322,957

CLASS 70

107 4,322,958
241 4,322,959

CLASS 71

35 4,323,386
87 4,323,387
88 4,323,388
124 4,323,389

CLASS 72

83 4,322,960
95 4,322,961
234 4,322,962
387 4,322,963

CLASS 73

1 C 4,322,965
1 G 4,322,964
7 4,322,966
15.6 4,322,967
27 R 4,322,968
40.5 R 4,322,969
118 4,322,970
159 4,322,971
168 4,322,972
517 R 4,322,973
602 4,322,974
633 4,322,975
659 4,322,976
701 4,322,977
705 4,322,978
4,322,979
727 4,322,980
810 4,322,981
861.22 4,322,982
862.68 4,322,983

CLASS 74

6 4,322,985
51 4,322,984
89.18 4,322,986
424.8 R 4,322,987
774 4,322,988

CLASS 75

0.5 A 4,323,390
14 4,323,391
58 4,323,392
166 C 4,323,393
208 R 4,323,394
212 4,323,395

CLASS 81

57.13 4,322,989

CLASS 82

3 4,322,990
4 R 4,322,991
34 R 4,322,992

CLASS 83

422 4,322,993
616 4,322,994

CLASS 84

1.19 4,322,995
1.24 4,322,996
479 A 4,322,997

CLASS 89

1.5 D 4,322,998
14 C 4,322,999
36 A 4,323,000

CLASS 91

25 4,323,001
4,323,002

CLASS 92

87 4,323,003

CLASS 99

275 4,323,004
400 4,323,005
519 4,323,006

CLASS 100

37 4,323,007
214 4,323,008
240 4,323,009

CLASS 101

110 4,323,010
305 4,323,011

CLASS 102

489 4,323,012

CLASS 104

7 B 4,323,013
13 4,323,014

CLASS 105

199 CB 4,323,015

CLASS 106

23 4,323,396
100 4,323,397

CLASS 108

51.1 4,323,016

CLASS 110

110 4,323,017
208 4,323,018

CLASS 111

2 4,323,019

CLASS 112

61 4,323,020
133 4,323,021
158 E 4,323,022
158 F 4,323,023
237 4,323,024

CLASS 114

25 4,323,025
219 4,323,026
285 4,323,027

CLASS 116

4,323,028

CLASS 118

231 4,323,029
309 4,323,030
720 4,323,031

CLASS 119

5 4,323,032
14.04 4,323,033
29 4,323,034
51 R 4,323,035
81 4,323,036

CLASS 122

4 D 4,323,037

CLASS 123

188 M 4,323,038
275 4,323,039
389 4,323,040
432 4,323,041
436 4,323,042
557 4,323,043
4,323,044
570 4,323,045
575 4,323,046

CLASS 124

1 4,323,047
78 4,323,048

CLASS 125

13 R 4,323,049
30 R 4,323,050

CLASS 126

77 4,323,051
440 4,323,052
441 4,323,053
449 4,323,054

CLASS 128

1.2 4,323,055
1.3 4,323,056
17 4,323,057
80 C 4,323,059
80 H 4,323,058
84 R 4,323,060
90 4,323,061
132 D 4,323,062
139 4,323,063
204.21 4,323,064
214 R 4,323,065
218 R 4,323,066
281 4,323,067
287 4,323,068
4,323,069
4,323,070
343 4,323,071
348 4,323,072
419 D 4,323,075
419 PG 4,323,074
419 R 4,323,073
644 4,323,076
660 4,323,077
728 4,323,078
731 4,323,079
774 4,323,080
785 4,323,081

CLASS 131

281 4,323,082
305 4,323,083
319 4,323,084

CLASS 132

113 4,323,085

CLASS 134

18 4,323,398
60 4,323,091

CLASS 136

249 4,323,719

CLASS 137

5 4,323,092
56 4,323,093
68 R 4,323,094
87 4,323,095
350 4,323,096
495 4,323,086
625.68 4,323,087

CLASS 138

106 4,323,088
109 4,323,089

CLASS 141

70 4,323,090
168 4,323,097

CLASS 144

2 R 4,323,098
3 R 4,323,099
134 D 4,323,100
323 4,323,101

CLASS 148

12.7 A 4,323,399
39 4,323,401
133 4,323,402
134 4,323,403
148 4,323,404

CLASS 152

175 4,323,102
213 A 4,323,103

CLASS 156

64 4,323,405
91 4,323,406
4,323,407
175 4,323,408
219 4,323,409
228 4,323,410
245 4,323,411
335 4,323,412
382 4,323,413
414 4,323,414
433 4,323,415
521 4,323,416
613 4,323,417
617 SP 4,323,418
622 4,323,419
628 4,323,420
630 4,323,421
636 4,323,422
645 4,323,423

CLASS 159

48 R 4,323,424

CLASS 160

92 4,323,104
309 4,323,105

CLASS 162

168 N 4,323,425
398 4,323,426

CLASS 164

260 4,323,106
416 4,323,107
488 4,323,108

CLASS 165

1 4,323,109
2 4,323,110
25 4,323,111
27 4,323,112
45 4,323,113
78 4,323,114
79 4,323,115
97 4,323,116

CLASS 166

55 4,323,117
96 4,323,118
177 4,323,119
251 4,323,120
4,323,121
267 4,323,122
302 4,323,123
303 4,323,124

CLASS 172

59 4,323,125
147 4,323,126

CLASS 173

53 4,323,127

CLASS 174

21 JS 4,323,720
36 4,323,721
43 4,323,722
48 4,323,723
4,323,724
65 R 4,323,725
68.5 4,323,726
135 4,323,727

CLASS 175

57 4,323,128
285 4,323,129
329 4,323,130
413 4,323,131

CLASS 177

139 4,323,132

CLASS 178

3 4,323,728
22.01 4,323,729

CLASS 179

1 GS 4,323,731
1 P 4,323,730
1 SM 4,323,732
6.3 R 4,323,733
18 FA 4,323,734
99 LC 4,323,735
111 R 4,323,736
115.5 R 4,323,737
175.1 R 4,323,738
189 D 4,323,739

CLASS 180

65 R 4,323,133
176 4,323,134
228 4,323,135
271 4,323,136
305 4,323,137

CLASS 181

147 4,323,138
263 4,323,139

CLASS 182

128 4,323,140

CLASS 187

8.47 4,323,141

29 R 4,323,142

CLASS 188

71.9 4,323,143
196 A 4,323,144
322.11 4,323,145

CLASS 192

6 A 4,323,146

CLASS 194

48 4,323,147
100 A 4,323,148

CLASS 198

471 4,323,149
690 4,323,150
740 4,323,151
751 4,323,152

CLASS 200

5 A 4,323,740
81.9 R 4,323,741
82 C 4,323,742
148 F 4,323,743
153 LB 4,323,744

CLASS 202

83 4,323,429

CLASS 203

7 4,323,430
72 4,323,431
85 4,323,432

CLASS 204

56 R 4,323,433
98 4,323,434
4,323,435
4,323,436
4,323,437
128 4,323,438
180 G 4,323,439
195 S 4,323,440
224 R 4,323,441
237 4,323,442
253 4,323,443
269 4,323,444
300 R 4,323,445

CLASS 206

45.13 4,323,153
216 4,323,154
328 4,323,155
333 4,323,156
385 4,323,157

CLASS 208

8 LE 4,323,447
8 R 4,323,446
85 4,323,448

CLASS 209

17 4,323,449
524 4,323,158
548 4,323,159
632 4,323,160

CLASS 210

11 S 4,323,450
160 4,323,451
188 4,323,452
321.1 4,323,453
4,323,454
321.2 4,323,455
529 4,323,456
645 4,323,457
688 4,323,458
700 4,323,459
4,323,460
4,323,461
714 4,323,462

CLASS 211

41 4,323,161
100 4,323,162
189 4,323,163

CLASS 213

145 4,323,164

CLASS 215

320 4,323,165

CLASS 219

10.55 A 4,323,745
10.55 C 4,323,747
10.55 F 4,323,746
10.71 4,323,748
69 M 4,323,749
76.1 4,323,750
91.21 4,323,751
101 4,323,752
107 4,323,753
4,323,754
121 LF 4,323,756
121 LJ 4,323,755
121 LN 4,323,757
125.1 4,323,758
137 PS 4,323,759
213 4,323,607
364 4,323,760
377 4,323,761
482 4,323,762
497 4,323,763
4,323,764

CLASS 220

86 R 4,323,166
408 4,323,167

CLASS 221

42 4,323,168
124 4,323,169

CLASS 222

70 4,323,170
82 4,323,171
130 4,323,172
136 4,323,173
146 H 4,323,174
256 4,323,175
326 4,323,176
386 4,323,177
415 4,323,178
449 4,323,179

CLASS 224

202 4,323,180
253 4,323,181
321 4,323,182

CLASS 225

42 Re.30,895

CLASS 227

3 4,323,183
120 4,323,184

CLASS 228

114 4,323,185
173 E 4,323,186

CLASS 229

34 R 4,323,187
41 R 4,323,188
62 4,323,189

CLASS 233

46 4,323,190

CLASS 235

55 A 4,323,765
89 R 4,323,766
92 SB 4,323,768
92 SH 4,323,767
200 WB 4,323,769
375 4,323,770
377 4,323,771
463 4,323,772
473 4,323,773

CLASS 236

44 A 4,323,191
46 R 4,323,192

CLASS 239

44 4,323,193
177 4,323,194
215 4,323,195
532 4,323,196
703 4,323,197

CLASS 241

5 4,323,198
284 4,323,199

CLASS 242

7.21 4,323,200
56 R 4,323,201
68.5 4,323,202
84.2 A 4,323,203
107.2 4,323,204
107.4 A 4,323,205
129.6 4,323,206
198 4,323,207

CLASS 244

3.28 4,323,208
104 FP Re.30,896
199 4,323,209

CLASS 246

26 4,323,210
169 A 4,323,211

CLASS 248

51 4,323,212
222.1 4,323,213
452 4,323,214
544 4,323,215
550 4,323,216
604 4,323,217

CLASS 249

65 4,323,218

CLASS 250

214 A 4,323,774
252 4,323,782
317.1 4,323,775
332 4,323,776
339 4,323,777
367 4,323,778
401 4,323,779
419 4,323,780
422 4,323,781
445 T 4,323,783
4,323,784
461 R 4,323,785
559 4,323,786

CLASS 251

5 4,323,219
11 4,323,220
58 4,323,221

CLASS 252

8.55 D 4,323,463
62.59 4,323,464
102 4,323,465
106 4,323,466
4,323,467
174.17 4,323,468
182 4,323,469
182.1 4,323,470
299.61 4,323,471
4,323,472
4,323,473
307 4,323,474
373 4,323,475
389 R 4,323,476
397 4,323,477
408 4,323,478
432 4,323,479
439 4,323,480
455 Z 4,323,481
462 4,323,482
512 4,323,483
521 4,323,484

CLASS 254

274 4,323,222

CLASS 260

112 R 4,323,496
146 T 4,323,497
187 4,323,498
239.1 4,323,499
239.57 4,323,500
333 4,323,501
340 4,323,502
340.3 4,323,503
340.7 4,323,504
345.2 4,323,505
345.8 R 4,323,506
345.9 R 4,323,507
346.11 4,323,508
4,323,509
367 4,323,510
397.45 4,323,511
397.47 4,323,512
410.6 4,323,513
412.3 4,323,514
453 P 4,323,515
453.3 4,323,516
455 B 4,323,518
455 R 4,323,517
465.9 4,323,520

CLASS 261

50 A 4,323,521
72 R 4,323,522

CLASS 264

8 4,323,523
4,323,524
24 4,323,525
36 4,323,526
45.1 4,323,527
53 4,323,528
69 4,323,529
109 4,323,530
113 4,323,531
118 4,323,532
145 4,323,533
176 R 4,323,534
528 4,323,535

CLASS 266

54 4,323,223

CLASS 267

64.12 4,323,224

CLASS 269

43 4,323,225
208 4,323,226
254 R 4,323,227
296 4,323,228

CLASS 270

58 4,323,229

CLASS 271

12 4,323,230

CLASS 272

65 4,323,231
68 4,323,232
86 4,323,233
93 4,323,234
4,323,235
117 4,323,236
131 4,323,237

CLASS 273

1 G 4,323,238
72 A 4,323,239
85 R 4,323,240
121 A 4,323,241
153 R 4,323,242
153 S 4,323,243
155 4,323,244
157 R 4,323,245
186 A 4,323,246
235 R 4,323,247
236 4,323,248
249 4,323,249
400 4,323,250
407 4,323,251

CLASS 277

12 4,323,252
4,323,253
40 4,323,254
81 R 4,323,255
126 4,323,256
224 4,323,257

CLASS 280

7.12 4,323,258
7.13 4,323,259
47.25 4,323,260
87.04 A 4,323,261
154.5 R 4,323,262
279 4,323,263
405 A 4,323,264
604 4,323,265
707 4,323,266
803 4,323,267

CLASS 285

41 4,323,268
133 R 4,323,269
153 4,323,270

CLASS 292

341.18 4,323,271

CLASS 294

1 BA 4,323,272
78 R 4,323,273

CLASS 296

1 S 4,323,274
97 G 4,323,275
214 4,323,276
216 4,323,277

CLASS 297

481 4,323,278

CLASS 298

23 DF 4,323,279

CLASS 299

1 4,323,280
4,323,281
43 4,323,282

CLASS 305

10 4,323,283

CLASS 307

38 4,323,787
66 4,323,788
81 4,323,789
221 D 4,323,791
252 R 4,323,793
296 R 4,323,794
297 4,323,795
353 4,323,796
426 Re.30,898
490 4,323,797
491 4,323,798
549 4,323,792
571 4,323,799

CLASS 308

8.2 4,323,284
160 4,323,285
4,323,286
187.1 4,323,287
196 4,323,288
202 4,323,289

CLASS 310

52 4,323,800
4,323,801
59 4,323,802
4,323,803
72 4,323,804
237 4,323,805
266 4,323,806
306 4,323,808
313 A 4,323,809

CLASS 312

100 4,323,290
194 4,323,291
284 4,323,807

CLASS 313

24 4,323,810
99 4,323,811
198 4,323,812
250 4,323,813
390 4,323,814
422 4,323,815
433 4,323,816
440 4,323,817
481 4,323,818

CLASS 315

39.61 4,323,819
86 4,323,820
87 4,323,821
241 P 4,323,822
254 4,323,823
289 4,323,824
387 4,323,825
408 4,323,826

CLASS 318

3 4,323,827
45 4,323,828
55 4,323,829
158 4,323,830
245 4,323,831
341 4,323,832
376 4,323,833
696 4,323,834
729 4,323,835

CLASS 320

2 4,323,836

CLASS 322

7 4,323,837

CLASS 323

224 4,323,845
256 4,323,838
267 4,323,839
287 4,323,840
311 4,323,846

CLASS 324

51 4,323,841
158 R 4,323,842
204 4,323,843
212 4,323,844
327 4,323,847
338 4,323,848
428 4,323,849
439 4,323,850

CLASS 328

72 4,323,851

CLASS 330

9 4,323,852
43 4,323,853
256 4,323,854

CLASS 331

56 4,323,855
111 4,323,861

CLASS 332

9 R 4,323,862

CLASS 333

109 4,323,863
165 4,323,864
187 4,323,865
188 4,323,866
239 4,323,867

CLASS 335

38 4,323,868
274 4,323,869

CLASS 336

206 4,323,870

CLASS 337

7 4,323,871
158 4,323,872
186 4,323,873
244 4,323,874

CLASS 338

25 4,323,875

CLASS 339

5 M 4,323,292
17 CR 4,323,293
19 4,323,294
107 4,323,295
217 S 4,323,296

CLASS 340

56 4,323,877
63 4,323,878
134 4,323,879
146.3 AC 4,323,880
310 R 4,323,882
328 4,323,883
347 AD 4,323,886
4,323,887
347 CC 4,323,885
347 DA 4,323,884
365 A 4,323,888
373 4,323,889
524 4,323,890
709 4,323,891
724 4,323,892
756 4,323,893
764 4,323,894
782 4,323,895
800 4,323,896
825.48 4,323,881

CLASS 343

5 SA 4,323,898
18 E 4,323,897
55 A 4,323,899
700 MS 4,323,900
754 4,323,901
903 4,323,902

CLASS 346

32 4,323,903
74.3 4,323,933
74.7 4,323,904
75 4,323,905
76 L 4,323,906
140 R 4,323,907
4,323,908

CLASS 350

6.8 4,323,297
36 4,323,298
91 4,323,299
96.21 4,323,300
117 4,323,301
426 4,323,302

CLASS 354

25 4,323,303
62 4,323,304
106 4,323,305

CLASS 355

3 R Re.30,897
15 4,323,306
51 4,323,307
57 4,323,308

CLASS 356

319 4,323,309
350 4,323,310
431 4,323,311

CLASS 357

13 4,323,909
23 4,323,910
30 4,323,911
31 4,323,912
51 4,323,913
82 4,323,914

CLASS 358

4 4,323,915
13 4,323,916
28 4,323,917
50 4,323,918
75 4,323,919
88 4,323,920
114 4,323,921
117 4,323,922
171 4,323,923
188 4,323,924
213 4,323,925
237 4,323,926
296 4,323,927
299 4,323,928
301 4,323,929

CLASS 360

10 4,323,930
40 4,323,931
45 4,323,932
61 4,323,934
73 4,323,935
85 4,323,936
96.6 4,323,937
105 4,323,938
106 4,323,939
113 4,323,940
123 4,323,941

CLASS 361

56 4,323,942
114 4,323,943
152 4,323,944

160 4,323,945
218 4,323,946
228 4,323,947
315 4,323,948
428 4,323,949
433 4,323,950

CLASS 362

17 4,323,952
27 4,323,951
226 4,323,953
267 4,323,954
278 4,323,955
374 4,323,956

CLASS 363

21 4,323,957
28 4,323,958
40 4,323,959
48 4,323,960
56 4,323,961
127 4,323,962

CLASS 364

200 4,323,963
4,323,964
4,323,965
4,323,966
4,323,967
4,323,968
426 4,323,969
436 4,323,970
469 4,323,971
482 4,323,972
515 4,323,973
4,323,974
559 4,323,975
565 4,323,976
571 4,323,977
702 4,323,978
708 4,323,979
724 4,323,980
749 4,323,981
786 4,323,982

CLASS 365

8 4,323,983
10 4,323,984
157 4,323,985
174 4,323,986
229 4,323,987

CLASS 366

102 4,323,312
142 4,323,313
167 4,323,314

CLASS 367

4 4,323,988
17 4,323,989
21 4,323,990
40 4,323,876
83 4,323,991
108 4,323,992
127 4,323,993
183 4,323,994

CLASS 368

75 4,323,995
88 4,323,996

CLASS 369

19 4,323,999
33 4,323,997
43 4,323,998

CLASS 370

85 4,324,000
102 4,323,790

CLASS 372

2 4,323,857
32 4,323,860
46 4,323,856
4,323,859
107 4,323,858

CLASS 373

73 4,323,718
101 4,323,717

CLASS 375

90 4,324,001

CLASS 376

230 4,323,427
353 4,323,428

CLASS 400

63 4,323,315
91 4,323,316
118 4,323,317

CLASS 402

17 4,323,318

CLASS 403

171 4,323,319

CLASS 404

10 4,323,320
105 4,323,321

CLASS 405

217 4,323,322

CLASS 407

119 4,323,323

CLASS 408

124 4,323,324

CLASS 409

131 4,323,325

CLASS 411

412 4,323,326

CLASS 414

28 4,323,327
563 4,323,328
737 4,323,329

CLASS 415

207 4,323,330

CLASS 416

9 4,323,331
134 A 4,323,332

CLASS 417

63 4,323,333
68 4,323,334

CLASS 418

61 B 4,323,335

CLASS 422

56 4,323,536
63 4,323,537
207 4,323,538
278 4,323,539

CLASS 423

10 4,323,540
37 4,323,541
213.5 4,323,542
219 4,323,543
239 4,323,544
625 4,323,545

CLASS 424

1 4,323,546
4,323,547
28 4,323,557
44 4,323,548
45 4,323,549
52 4,323,550
54 4,323,551
4,323,552
61 4,323,553
63 4,323,554
84 4,323,556
88 4,323,555
164 4,323,558
177 4,323,559
4,323,560
180 4,323,561
195 4,323,562
199 4,323,563
241 4,323,564
246 4,323,565
248.51 4,323,566
4,323,567
250 4,323,568
251 4,323,569
4,323,570
4,323,571
4,323,572
253 4,323,573
263 4,323,574
267 4,323,575
273 P 4,323,576
298 4,323,577
4,323,578
322 4,323,579
324 4,323,580
4,323,581
325 4,323,582

CLASS 425

126 S 4,323,336
155 4,323,337
174.8 E 4,323,338
199 4,323,339
325 4,323,340
526 4,323,341

CLASS 426

250 4,323,583
285 4,323,584
394 4,323,585
412 4,323,586
540 4,323,587
564 4,323,588

CLASS 427

38 4,323,589
4,323,590
53.1 4,323,591
54.1 4,323,592
97 4,323,593
98 4,323,594
123 4,323,595
127 4,323,596
160 4,323,597
4,323,598
181 4,323,599
202 4,323,600
287 4,323,601
298 4,323,602
433 4,323,604

CLASS 428

17 4,323,605
35 4,323,606
36 4,323,400
43 4,323,608
65 4,323,609
67 4,323,611
68 4,323,610
89 4,323,612
111 4,323,613
116 4,323,614
121 4,323,615
134 4,323,616
148 4,323,617
212 4,323,618
4,323,619
215 4,323,620
216 4,323,621
230 4,323,622
246 4,323,623
270 4,323,624
361 4,323,625
374 4,323,626
398 4,323,627
425.9 4,323,628
457 4,323,629
542 4,323,630
605 4,323,631
626 4,323,632

CLASS 430

17 4,323,633
110 4,323,634
217 4,323,635
271 4,323,636
4,323,637
275 4,323,638
281 4,323,639
353 4,323,640
370 4,323,641
438 4,323,642
441 4,323,643
518 4,323,644
564 4,323,645
622 4,323,646

CLASS 431

66 4,323,342
202 4,323,343

CLASS 432

106 4,323,344

CLASS 433

7 4,323,345
58 4,323,346
141 4,323,347
228 4,323,348

CLASS 434

184 4,323,349
269 4,323,350
274 4,323,351

CLASS 435

7 4,323,647
125 4,323,648
136 4,323,649
174 4,323,650
207 4,323,651

CLASS 440

27 4,323,352
63 4,323,353
75 4,323,354
76 4,323,355
86 4,323,356

CLASS 455

27 4,324,002

CLASS 474

82 4,323,357

CLASS 501

17 4,323,652
32 4,323,653
47 4,323,654

CLASS 521

88 4,323,655
109 4,323,656
116 4,323,657
174 4,323,658

CLASS 523

409 4,323,490

CLASS 524

144 4,323,491
156 4,323,495
388 4,323,492
451 4,323,493
545 4,323,603
788 4,323,489
858 4,323,494

CLASS 525

54.1 4,323,486
54.32 4,323,487
108 4,323,659
161 4,323,660
237 4,323,485
259 4,323,661
281 4,323,662
470 4,323,663

CLASS 526

88 4,323,664
122 4,323,665
329 4,323,666

CLASS 528

32 4,323,488
138 4,323,667
173 4,323,668
499 4,323,519

CLASS 536

38 4,323,669

CLASS 542

415 4,323,670
4,323,671
421 4,323,672
426 4,323,673
4,323,674
463 4,323,675

CLASS 544

22 4,323,676
135 4,323,677
243 4,323,678
256 4,323,679
293 4,323,680
323 4,323,681
353 4,323,682

CLASS 546

6 4,323,683
19 4,323,684
300 4,323,685

CLASS 548

165 4,323,686
264 4,323,687
330 4,323,688
336 4,323,689

CLASS 556

470 4,323,690

CLASS 560

36 4,323,691
65 4,323,692
103 4,323,693
4,323,694
145 4,323,695
220 4,323,696
232 4,323,697
233 4,323,698

CLASS 562

416 4,323,699
460 4,323,700
462 4,323,701
485 4,323,702
546 4,323,703
561 4,323,704

CLASS 564

151 4,323,705
253 4,323,706
324 4,323,707
418 4,323,708
476 4,323,709

CLASS 568

315 4,323,710
347 4,323,711
697 4,323,712
766 4,323,713
4,323,714
4,323,715

CLASS 570

243 4,323,716

CLASSIFICATION OF DESIGNS

D2— 27 263,640
263,641
271 263,642
309 263,643
318 263,644
320 263,645
321 263,646
263,647
D3— 44 263,648
52 263,649
53 263,650
63 263,651
73 263,652
D6— 28 263,653
41 263,654
57 263,655
62 263,656
63 263,657
71 263,658
83 263,659
86 263,660
99 263,661
263,662
113 263,663
164 263,664
185 263,665
186 263,666
D7— 22 263,667
29 263,668
72 263,669
95 263,670
158 263,671
D8— 18 263,673
27 263,674
343 263,675
382 263,676
396 263,677
399 263,678
263,679
D9— 341 263,680
263,681
263,682
400 263,683
426 263,684
452 263,685
457 263,686
D10— 39 263,687
60 263,688
D11— 135 263,689
D12— 110 263,693
143 263,694
155 263,695
185 263,696
203 263,697
D13— 13 263,698
28 263,699
D14— 6 263,700
11 263,701
53 263,702
263,703
263,704
263,705
263,706
66 263,707
94 263,708
95 263,709
106 263,710
D15— 5 263,711
97 263,712
124 263,713
140 263,714
199 263,715
D16— 1 263,716
263,717
19 263,718
28 263,719
42 263,720
135 263,721
D18— 4 263,722
263,723
D19— 92 263,724
D21— 27 263,725
39 263,726
87 263,727
191 263,728
212 263,729
226 263,731
254 263,730
D22— 7 263,732
D23— 50 263,733
77 263,734
127 263,735
141 263,736
151 263,737
163 263,738
D24— 10 263,739
12 263,742
17 263,740
19 263,743
21 263,741
28 263,744
29 263,745
58 263,746
64 263,747
D25— 74 263,748
263,749
263,750
263,751
263,752
263,753
263,754
263,755
263,756
263,757
263,758
263,759
263,760
D26— 83 263,761
93 263,762
D30— 15 263,763
43 263,764
D32— 70 263,672
D34— 24 263,690
26 263,691
29 263,692

P.—	9	4,835	54	4,836			

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

364—	706	T101,701	526—	352	T101,702		

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,322,911
4,323,219
4,323,352
04 : 4,322,860
4,323,243
4,322,999
4,323,255
4,323,097
4,323,256
4,323,141
4,323,263
4,323,249
4,323,285
4,323,424
4,323,293
4,323,539
4,323,310
4,323,740
4,323,324
4,323,879
4,323,328
4,323,897
4,323,336
4,323,958
4,323,337
05 : 4,323,046
4,323,358
06 : 4,322,882
4,323,365
4,322,887
4,323,408
4,322,894
4,323,419
4,322,895
4,323,427
4,322,897
4,323,439
4,322,903
4,323,467
4,322,915
4,323,471
4,322,928
4,323,472
4,322,946
4,323,473
4,322,949
4,323,478
4,322,950
4,323,494
4,322,954
4,323,504
4,322,967
4,323,507
4,322,969
4,323,521
4,322,975
4,323,555
4,322,984
4,323,558
4,322,998
4,323,564
4,323,000
4,323,574
4,323,009
4,323,746
4,323,016
4,323,777
4,323,017
4,323,779
4,323,032
4,323,780
4,323,043
4,323,825
4,323,049
4,323,846
4,323,057
4,323,849
4,323,071
4,323,858
4,323,072
4,323,880
4,323,079
4,323,887
4,323,086
4,323,894
4,323,088
4,323,901
4,323,114
4,323,908
4,323,118
4,323,915
4,323,119
4,323,920
4,323,124
4,323,930
4,323,129
4,323,931
4,323,176
4,323,938
4,323,180
4,323,939
4,323,187
4,323,957
4,323,202
4,323,959
4,323,961
4,323,969
4,323,983
4,323,995
4,324,000
4,324,002
08 : 4,323,127
4,323,233
4,323,390
4,323,533
4,323,538
4,323,601
4,323,741
09 : 4,322,907
4,322,945
4,322,965
4,323,051
4,323,094
4,323,142
4,323,149
4,323,157
4,323,230
4,323,287
4,323,332
4,323,334
4,323,456
4,323,499
4,323,506
4,323,522
4,323,724
4,323,756
4,323,769
4,323,771
4,323,925
4,323,987
10 : 4,323,482
4,323,483
4,323,580
4,323,636
4,323,637
4,323,904
4,323,929
11 : Re.30,894
4,323,026
12 : 4,322,936
4,322,939
4,323,007
4,323,063
4,323,100
4,323,104
4,323,163
4,323,201
4,323,250
4,323,251
4,323,272
4,323,429
4,323,582
4,323,605
4,323,647
4,323,736
4,323,743
4,323,808
4,323,838
4,323,926
4,323,946
4,323,949
13 : 4,322,890
4,323,005
15 : 4,322,940
16 : 4,323,012
4,323,338
17 : 4,322,909
4,322,925
4,322,938
4,322,981
4,322,988
4,322,996
4,323,062
4,323,112
4,323,115
4,323,120
4,323,121
4,323,150
4,323,189
4,323,215
4,323,227
4,323,238
4,323,279
4,323,316
4,323,318
4,323,321
4,323,330
4,323,367
4,323,376
4,323,401
4,323,452
4,323,481
4,323,493
4,323,542
4,323,583
4,323,587
4,323,630
4,323,691
4,323,712
4,323,713
4,323,714
4,323,715
4,323,721
4,323,731
4,323,748
4,323,796
4,323,896
4,323,917
4,323,923
4,323,924
4,323,973
4,323,977
18 : 4,322,914
4,322,977
4,322,995
4,323,113
4,323,134
4,323,217
4,323,226
4,323,385
4,323,584
4,323,624
4,323,707
4,323,744
4,323,827
4,323,948
4,323,953
4,323,955
19 : 4,322,871
4,323,852
4,323,863
20 : Re.30,893
4,323,742
21 : 4,323,084
4,323,240
4,323,342
22 : 4,322,858
4,323,989
24 : 4,323,025
4,323,035
4,323,172
4,323,518
4,323,798
4,323,842
4,323,855
4,323,868
4,323,900
4,323,988
4,323,991
25 : 4,322,878
4,322,879
4,322,886
4,322,961
4,323,036
4,323,145
4,323,190
4,323,247
4,323,259
4,323,298
4,323,349
4,323,368
4,323,409
4,323,422
4,323,537
4,323,545
4,323,546
4,323,599
4,323,738
4,323,763
4,323,789
4,323,795
4,323,812
4,323,824
4,323,836
4,323,851
4,323,860
4,323,861
4,323,885
4,323,898
4,323,899
4,323,950
4,323,964
4,323,965
4,323,967
26 : 4,322,901
4,322,913
4,322,922
4,322,951
4,322,973
4,323,093
4,323,116
4,323,151
4,323,152
4,323,166
4,323,182
4,323,264
4,323,288
4,323,294
4,323,325
4,323,373
4,323,420
4,323,531
4,323,552
4,323,602
4,323,660
4,323,672
4,323,673

4,323,674
4,323,762
4,323,786
4,323,966
27 : 4,322,862
4,322,873
4,322,875
4,322,877
4,322,905
4,322,918
4,322,919
4,322,932
4,322,964
4,323,034
4,323,055
4,323,074
4,323,081
4,323,122
4,323,132
4,323,207
4,323,369
4,323,423
4,323,487
4,323,591
4,323,773
4,323,826
4,323,854
28 : 4,322,963
29 : 4,322,859
4,322,869
4,322,916
4,323,096
4,323,387
4,323,453
4,323,459
4,323,460
4,323,461
4,323,477
4,323,610
4,323,623
4,323,677
4,323,686
4,323,690
4,323,809
4,323,821
4,323,871
31 : 4,323,194
4,323,313
4,323,883
34 : 4,322,966
4,322,989
4,323,011
4,323,023
4,323,024
4,323,031
4,323,047
4,323,091
4,323,158

4,323,206
4,323,242
4,323,301
4,323,307
4,323,421
4,323,437
4,323,446
4,323,465
4,323,466
4,323,480
4,323,511
4,323,512
4,323,516
4,323,544
4,323,581
4,323,594
4,323,638
4,323,656
4,323,685
4,323,693
4,323,694
4,323,697
4,323,698
4,323,706
4,323,710
4,323,733
4,323,735
4,323,739
4,323,799
4,323,813
4,323,815
4,323,816
4,323,820
4,323,910
4,323,911
4,323,916
4,323,918
4,323,942
4,323,954
4,323,963
4,323,979
4,323,992
35 : 4,323,857
36 : Re.30,895
4,322,865
4,322,883
4,322,888
4,322,893
4,322,910
4,322,974
4,322,985
4,323,027
4,323,052
4,323,053
4,323,056
4,323,077
4,323,105
4,323,109

4,323,155
4,323,161
4,323,183
4,323,211
4,323,237
4,323,244
4,323,246
4,323,260
4,323,286
4,323,299
4,323,341
4,323,345
4,323,346
4,323,347
4,323,351
4,323,395
4,323,462
4,323,463
4,323,489
4,323,528
4,323,536
4,323,588
4,323,589
4,323,597
4,323,609
4,323,614
4,323,634
4,323,640
4,323,642
4,323,653
4,323,654
4,323,668
4,323,727
4,323,788
4,323,840
4,323,848
4,323,882
4,323,888
4,323,907
4,323,914
4,323,962
4,323,968
4,323,986
37 : 4,323,019
4,323,083
4,323,099
4,323,188
4,323,231
4,323,350
4,323,379
4,323,454
4,323,573
4,323,645
4,323,651
4,323,679
4,323,772
4,323,790
38 : 4,323,414

39 : 4,322,899
4,322,923
4,322,929
4,322,976
4,322,990
4,323,003
4,323,008
4,323,010
4,323,015
4,323,068
4,323,069
4,323,078
4,323,102
4,323,103
4,323,110
4,323,160
4,323,173
4,323,186
4,323,193
4,323,248
4,323,266
4,323,270
4,323,295
4,323,329
4,323,340
4,323,400
4,323,411
4,323,412
4,323,441
4,323,508
4,323,520
4,323,534
4,323,551
4,323,586
4,323,595
4,323,603
4,323,613
4,323,615
4,323,625
4,323,632
4,323,683
4,323,703
4,323,751
4,323,753
4,323,754
4,323,785
4,323,818
4,323,835
4,323,886
4,323,902
40 : 4,323,123
4,323,203
4,323,221
4,323,343
4,323,353
4,323,606
41 : 4,323,154

4,323,196
4,323,273
4,323,327
4,323,722
4,323,847
42 : 4,322,880
4,322,930
4,322,933
4,322,955
4,323,028
4,323,058
4,323,064
4,323,075
4,323,144
4,323,168
4,323,210
4,323,214
4,323,232
4,323,261
4,323,280
4,323,281
4,323,333
4,323,428
4,323,430
4,323,447
4,323,526
4,323,540
4,323,561
4,323,578
4,323,655
4,323,681
4,323,692
4,323,723
4,323,726
4,323,755
4,323,765
4,323,774
4,323,797
4,323,804
4,323,814
4,323,823
4,323,830
4,323,875
4,323,878
4,323,932
45 : 4,322,920
4,323,139
4,323,171
4,323,415
4,323,760
46 : 4,323,972
47 : 4,322,908
4,323,021
4,323,164
4,323,198
4,323,449
4,323,960

48 : Re.30,898
4,322,992
4,323,020
4,323,044
4,323,065
4,323,076
4,323,128
4,323,130
4,323,131
4,323,138
4,323,209
4,323,268
4,323,284
4,323,319
4,323,417
4,323,435
4,323,658
4,323,665
4,323,732
4,323,876
4,323,956
4,323,990
4,323,994
49 : 4,323,067
50 : 4,323,426
51 : 4,322,991
4,323,216
4,323,245
4,323,258
4,323,292
4,323,641
4,323,669
4,323,764
4,323,867
4,324,001
53 : 4,323,080
4,323,181
4,323,234
4,323,331
4,323,433
4,323,734
54 : 4,323,513
55 : 4,322,868
4,322,904
4,322,935
4,322,953
4,323,117
4,323,126
4,323,156
4,323,290
4,323,354
4,323,356
4,323,470
4,323,557
4,323,709
4,323,793
4,323,874

DESIGN PATENTS

01 : 263,764
04 : 263,648
263,649
263,650
06 : 263,644
263,646
263,647
263,651
263,677
263,679
263,681
263,682

263,692
263,711
263,713
263,721
263,727
263,737
263,739
263,745
263,748
263,761
08 : 263,691
09 : 263,645

263,672
263,735
12 : 263,747
263,762
17 : 263,678
263,715
263,742
18 : 263,741
19 : 263,664
24 : 263,666
263,689
263,700

263,744
25 : 263,684
263,719
26 : 263,749
27 : 263,668
263,724
28 : 263,652
29 : 263,673
263,685
31 : 263,725
34 : 263,656
263,659

263,695
263,722
263,723
263,729
36 : 263,655
263,688
263,716
263,736
39 : 263,653
263,693
263,699
40 : 263,665

263,690
41 : 263,697
42 : 263,734
44 : 263,686
48 : 263,675
263,728
263,732
49 : 263,740
50 : 263,654
55 : 263,669
263,746

PLANT PATENTS

48 : 4,836
51 : 4,835

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

06 : T101,701
47 : T101,702

U.S. GOVERNMENT PRINTING OFFICE : O—1982

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Gerald J. Mossinghoff, *Commissioner*